

# KA JINGREP HA MEGHALAYA



B.M. PUGH

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# **KA JINGREP HA MEGHALAYA**

B. M. Pugh

2000

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**Edited by:**

**Banteilang S. Rumnong**

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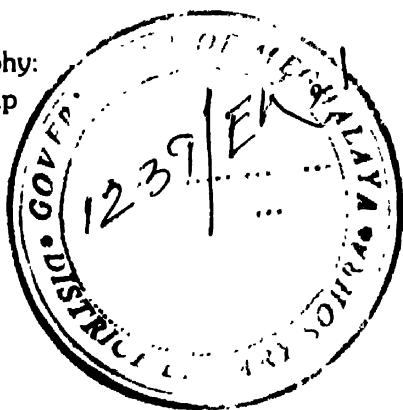
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## KYNTIEN AI KHUBLEI

Nga dap da ka jingsngewnguh ia kine ki samla, u Banteilang Singh Rumnong, M.Sc. (Agri) ba trei mynta kum u Lecturer ha ka State Institute of Rural Development (SIRD), Meghalaya bad u Nathaniel J. D. Shadap, B. Sc. (Agri) ba trei mynta kum u Farm Manager, Potato Experimental Station, Upper Shillong, kiba la pyllait por bad leh shitom ban khmih, ban pynthymmai, ban pynbeit bad pynbit pynbiang ia kane ka kot rep kat kum ka jingdawa ha ka jingkylla ka por.

Ha ka snem 1982-83 la don ki ba pynsngew ha i Rev. B. M. Pugh (Bam kwai ha ling U Blei) ban shon biang ia kane ka kot (namar khlem da shon shuh) ba ka long kaba myntoi ia ki nongrep. Namar ba i la dkhat lade bad shongthait la bun snem na ka kam hikai ha ka Kolej rep, shuwa ban shon biang ia kane ka kot, i la pan jingiarap na kito ki rangbah kiba don ha ka Agriculture Department jong ka Sorkar Meghalaya ha ka ban pynthymmai bad pynbeit pynbiang kat kum ka jingdonkam ka por. Hynrei namar ka jingteh ka kam ki khlem ioh por ban leh kumta. Kumta i khlem lah ban pynmih ia kane ka kot ha ka por ba i dang im wat la i la thoh bad pynbiang ia ka 'Tien Lamphrang.

Nga kyrmen ba kane ka kot, **KA JINGREP HA MEGHALAYA**, kaba la pynthymmai kan long ka jingiarap bad jingmyntoi ia ki nongrep shi tyllup ka ri Khasi-Jaintia bad ia ki nonghikai ha ki skul rep bad ha ki training centre.

Nga ai khublei bad nga pynpaw biang ia ka jingsngewnguh ia kitei ki samla baroh arngut. To U Blei Trai Kynrad ruh Un nang kyrkhu kyrdoh ba kin nang iaid shaphrang, bad ba kin nang iai noh ia ki symboh jingtip jingshemphang ban nangroi nangsang ka rep ka riang ban dap ban khlup, ban san ban kiew ka khih ka kamai shityllup. Nga sngewdei ban ai khublei ruh ia u Maqbool Lyngdoh, Senior Scientific Assistant, Tea Experimental Station, Umsning, ia ka jingiarap jong u ha ka lynnong kaba iadei bad u Slasha bad u Navin Bahl, u ba don

mynta ha Coffee Board, Shillong, u ba la ai ka jingiarap jong u  
ha ka lynnong kaba iadei bad u Kophi. Nga ai khublei ruh ia i  
Kong B. L. Mawlong i ba la iarap ha ka ban type ia kane ka kot  
bad ruh ia baroh kito kiba la iarap kat ba lah ei la i bor.

Khublei

Sitimon Sawian  
(Mrs. B. M. Pugh)

## KA 'TIEN LAMPHRANG

Nga la thoh ia kawei ka kot ha ka ktien Khasi ha ka snem 1948 kaba nga la khot KA KOT REP. Kito kiba la pyndonkam ia ka ki la kyntu ia nga ba ngan pynmih biang ia ka namar ba kam shym don shuh ha ki dukan die-kot la bun snem. Namar ba nga la long u nonghikai lajan baroh shi lynter ka jingim jong nga, ngam sngew lah ban kiar na kane ka kam wat la nga tip ba ka long kaba khia, kham tam ha kine ki snem (1982-83) haba nga la dap 85 snem ka rta.



Khnang ban pynbiang ia katei ka jingkwah, la sngew donkam ban thoh thymmai da kane ka kot kaba nga khot KA JINGREP HA MEGHALAYA, kaba pyni ym tang ia ka jingkylla jong ki por, hynrei kham tam ia ka jingroi jong ka jingstad ha ka rep hi. Da kaba ngeit ba kane ka kot kan iarap kham tam ia kiba rep ha ri Khasi Jaintia, nga la thoh ia ka ha ka ktien Khasi, ym ha ka English kaba long mynta ka Official State Language jong ka Meghalaya. La kumta ruh nga kyrmen ba yn lah ban pynkylla ia ka sha ka ktien Garo bad lehse sha kiwei pat ki ktien 'riewlum jong kito kiba shong ha kine ki thain jong ka ri India.

Ka jingrep ka long ka kam kaba bun ki ju pyrkhat ba ka long kaba ngi iatip baroh; hynrei ngi la tip mynta ba ka jingrep ruh ka donkam ka jingnang-jingtip kaba bun syrtap ba yn ym lah satia ban thoh lut ia ka ha kane ka kitab kaba rit. Ngan pyrshang hangne tang ban iathuh ia kiei-kiei kiba nga ngeit kin iarap ia u nongrep ha ri Khasi-Jaintia bad lehse ia kito kiba ha kine ki ri lum jong ka North-East India lada yn lah ban pynkylla ia ka sha ki ktien jong ki.

Uwei u briew uba stad, U Sir Joseph Hutchinson, uba la long ha kawei ka por U Botanist bad Chief Geneticist jong ka British Empire Cotton Growing Corporation, bad hadien pat u Professor of Agriculture ha Cambridge University, England, u

la ong, "Kam long kaba lah ia uwei u briew ban study ne wad jingtip ka ban biang ia uno-uno uwei u jingthung wat lada uta u briew u leh ia kata baroh shi rta ka jingim jong u". U nongrep uba stad ruh un shem ba um lah ban ong ba u long uba nang batip lut shaphang ka rep. Nalor kata, ka jingstad shaphang ka rep ruh ka nang roi bad, ngi tip, ba kane ka kot hadien katto-katne snem kan ym long kaba bit ba biang ban pule ia ka. Ngi kyrmen ba kane ka jingpyrshang ka jong ngi kan iarap ia kito kiba rep ha kine ki por mynta.

Ha kaba kut ngam lah khlem da pyni ia ka jingsngewnguh eh jong nga ia kito kiba la shimti ban thoh ia kito ki lynnong, kumba la pyni ha khlieh jong kawei-pa-kawei ka lynnong.

Shillong, 1983

*Brandon Marpna Pugh.*

# LYNNONG 1

## KA JINGDONKAM IA KA REP

### **Balei ngi wad jingstad ia ka ban rep**

Khnanng ba u briew un im suk im sain ha kane ka pyrthei, u donkam la kumno-kumno ia ka bam kaba biang, ka phong ka kup kaba biang bad ka iing ka sem ruh kaba biang. Na kine lai kiba u briew u donkam eh ha ka jingim jong u, kitei ar tylli, kaba nyngkong bad kaba ar, ki long kiba ngi ioh na ka rep. Ka jingrep namar kata ka long kawei kaba u briew u dei ban leh; bad ha kane ka pyrthei mynta ha kaba ki nongshong-shong ki nang roi stet katne-katne, ka jingrep ka long shisha ka jingtrei kaba u briew u dei ban trei.

Hynrei la shem ba ki ri kiba la iaaid shaphrang ki don kham khyndiat ki nongrep ban ia kito ki ri kiba sah dien. Ha ka pyrthei kaba la roi bad la stad don bun jait ki rukom jingtrei kiba pynmih ia kiba bun ki jingdonkam jong u briew. Kumta ki nongrep ha kito ki ri ki dei ban kham duna; bad khnanng ban pyndap bam ia kiwei pat ki nongtrei ha kano kano ka ri kaba la roi bad iaaid shaphrang ki nongrep ki la dei ban long kiba nang bha ia ka rep. Ha ri America (U.S.A.) uwei u nongrep u lah ban pynmih ka bam ia ka ban bsa haduh kumba 29 ngut ki briew. Kumta imat ka biang ban don tang saw ngut ki nongrep ha man la ka shispah ban bsa ia ki para nong-America. Hynrei namar ba ka ri America ka nang bad ka stad bha ha ka rukom rep, ka la lah ban phah u kew, na uba ngi ioh u ata bad u moida, sha kylleng ka pyrthei. Kumta ngi sngewthuh ba don kumba hynriew ngut ki nongrep ha man la ka shispah u nong-America. Hynrei ha kane ka ri India ka jong ngi, ki nongrep ki don haduh kumba 70 ne 80 na ka 100 ki nongshongshnong. Bad namar ba ka ri jong ngi ruh ka la nangiaid shaphrang ha kiba bun ki kam ki jam, ki nongrep kin sa nang kham duna bad ka jingnang jingtip kumno ban rep ruh ka la dei ban nang roi. Dang khyndiat

snem mynta ba ka ri jong ngi da ka jingwad ia ki jingstad kumno  
ban rep ka la lah ban pynmih ka bam kaba biang ia la u para  
nong-India baroh. Ha ki por kiba mynshuwa ngi kum ka ri hi  
baroh kawei ngi la leit wad ban pyndap jingbam na kiwei pat  
ki ri.

### **Ka histori jong ka rep ha ka pyrthei**

Ka jingtip ia ka rep, la iathuh ia ngi, ka sdang ynda haba u  
briew, kumba 8000 snem mynshuwa, u iohi ba ki symbai jong  
ki niut ba u bam bad wan rah sha ka jaka shong ka jong u, ki  
mih kum u jingthung uba thymmai haba la bret ia ki ha ka  
khyndew ha ki aiom bad samoi kaba biang. Kine ki symboh  
symbai, ym tang ba ki pynmih ki jingthung kiba thymmai, hynrei  
ki pynmih ruh bun shah ki symbai kiba ki lah ban bam ynda u  
jingthung u la iaw bha.

Kane ka jingshem jong kito ki briew, ha ka jinglong  
riewkhlaw jong ki, ka la long da shisha kaei kaei kaba la pynkylla  
khluk ia ka jingim u briew ha kane ka pyrthei. Na kaba u la ju  
im da kaba leit wad ia ki jingbam na ki madan phlang lane da  
ki soh na khlaw lane da ka ba leit beh mrad ka la pynlong ia u  
ban nang ban thung ki jingthung hajan ka jaka shong jong u  
hi: ka la pynlah ia u ban pynmih hi ha shen ia la ka bam.

Na kine ki phlang la mih hadien habud ki symboh-jingbam  
(food-grains) kum u kew, u barli, u kba bad bun kiwei-kiwei.  
Kito ki riw-hyndai ki la thung ruh ia kiwei-kiwei pat ki jingthung  
na kiba la wan mih ki bun jait ki jhur bad ki soh ki pai jong ki  
juk mynta.

Hoodid, don haduh mynta ki jait-byrnriew kiba im hi kum ha  
ki por hyndai : kiba im da ki jingbam khlaw bad da kaba beh  
mrad, hynrei kiwei pat te ki la nang iaia shaphrang.

Ki thain ha kiba la don ka jingrep kaba thikna ha ki por ba  
dang lung ka pyrthei ki la long, katba ngi tip, ha Egypt, harud  
jong ka wah Nile. bad ha Mesopotamia (Iraq), harud jong ki  
wah Euphrates bad Tigris. Lajan ha kijuh ki por ruh la sdang  
ia ka rukom rep kaba khambha ha China harud jong ka wah  
Hwangho (Yellow River) bad ka wah Yangtze-kiang, bad ha ri



India ruh harud jong ka wah Indus bad ka wah Ganges, bad lehse ha Southeast Asia (kata ha Bangladesh, kaba ju long mynshuwa shibynta na ka ri India, ka Burma, Thailand bad kiwei-kiwei ki ri).

Ka rukom rep ha ki por hyndai, kata shuwa ia ka 2000-1000 B.C. ruh ka la sdang ha ka rukom rep kaba iasyriem ia ka kaba ngi dang leh haduh mynta ha ki katto-katne ki ri lum jong kane ka ri. Kata. ki shu buh ne thep ia ki symbai ha ki thliw kiba rit ba la shu tih da u dieng ne u siej uba nep. Ka jingpyndonkam da ki tiar ba la thaw na ki kynja nar (metals) lane ka nar (iron) hi ka wan suki-suki, katba u briew u nang kham stad. Ha kito ki por ia ka kam rep hi la ju iehnoh ha ki kynthei, katba ki shynrang ki leit ap ia ka shnong ka thaw ban iada ia ka na ki nongshun.

Hadien-hadien, kum ha Egypt bad Mesopotamia ki briew ki la nang kumno ban pyndonkam ia ka sboh; ban shna ki nurum ba ka um kan tuid sha ki lyngkha; ban ri ki jingri ki ban ring ia ka lyngkor, kum ka ut, ka kada, ki kulai, ki masi bad kiwei-kiwei ki jingri. Ki nong China bad ki nong India ruh ki la ia tip ia kitei ki rukom rep ha kito hi ki hajar snem. Haba ia nujor bad ki ri Mihngi, ha kito ki por ka ri Phareng (Europe) ka dang sah shadien. Hynrei katba ki ri Sepngi ki nang iaaid shaphrang ha ka jingnang bad jingstad ban trei ha ki bun rukom naduh ka spah snem kaba khadhynriew (A.D.) ki ri Mihngi pat ki la shu sah hajuh. Ngi lah ban ong ba ka jingrep ha ka ri India ruh ka la shu neh hajuh wat haduh ki sngi bad ki snem kiba khadduh jong ka jingsynshar ka ri Bilat ia kane ka ri. Ki phareng (British) ha ka por jong ka jingsynshar jong ki ia kane ka ri ki la wad jingnang-jingtip tang shaphang kito ki jingthung kiba ka donkam ka ri Bilat, kum u kynphad uba ki donkam na ka bynta ki karkhana thain jain jong ki, lane u jingthung slasha na ka bynta ki kper sla-sha jong ki nong Bilat kiba ki phah pat ia u slasha sha ka ri jong ki bad sha kiwei-kiwei pat ki ri jong ka pyrthei. Ym shym don ka jingpyrshang kaba thikna ban wad kumno ban pynroi ia ka rep kba ne ka rep kew kiba long ki jingban kiba kongsam jong kane ka ri. Ka jingsdang ban

pynroi ia ka jingstad ha ka rep ka la long naduh ba ka ri ka la ioh ia ka jinglailuid ha ka snem 1947.

Ka jingpyrshang tynggeh pat ban pynroi ia ka rep ka riang ha kine ki thain ri lum jong ngi kiba shaphang mihngi ka ri India ka la sdang ha ka snem 1975 ynda ka Indian Council of Agricultural Research (ICAR) ka la pynieng ia ka Regional Complex jong ka ICAR ha kine ki thain hi, bad ka la buh ia ka headquarters jong ka ha Shillong. Mynta kane ka ophis ka don ha Khwan. Naduh kata ka por la don ka jingtip kaba kham thikna shaphang ka rukom rep ia ki jingthung kiba bun jait ha kine ki ri lum. Ngì khmih lynti ba kane ka jingleh ka Sorkar India kan iarap ia ki nongrep jong ngi ha Meghalaya ruh ba kin nang iaïd shaphrang.

## LYNNONG 2

### KI BYNTA U JINGTHUNG

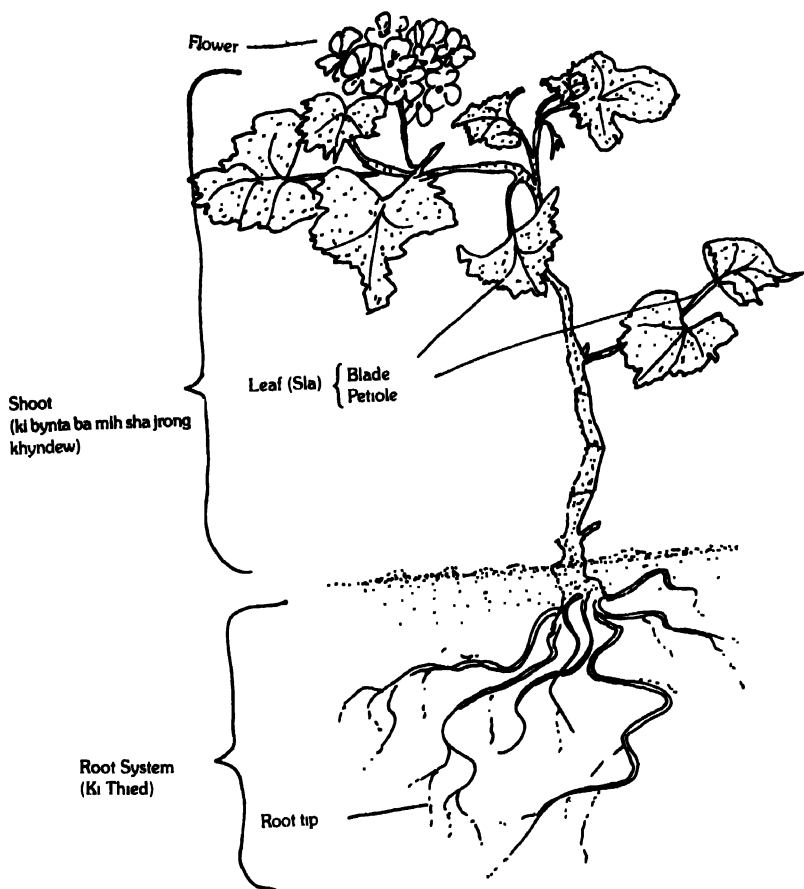
·Khnanng ba ngin sngewthuh shaphang ka rep, ka donkam ia ngi ban tip bad ban sngewthuh katto-katne ia ki bynta jong u jingthung bad ia ka jingtrei kam jong ki. U jingthung, ngi dei ban kynmaw, u long u jingthaw uba im; bad ka jingtrei jong u ruh ka long kaba phylla katta-katta. Ha kane ka lynnong, ngan kdew ia ki bynta kiba kham kongsan jong u jingthung bad batai lyngkot ia ka jingtrei bad jingdonkam jong ki.

Haba shu kren lyngkot, u jingthung u long tang ma u uba lah ban shna jingbam dalade ialade. U brieve lane u mrad, ki sim ki khniang bad kiwei-kiwei kim lah ban leh ia kata. U brieve u ioh ia ka jingbam ka jong u da kaba bam ia ki mrad, ki sim, ki khniang, lane ia ki jingthung. Ki mrad, ki sim, ki khniang ruh baroh ki leh kumjuh. Ka jingbam jong ki ka long da ki para mrad lane da kiwei kiwei baroh kiba don jingim, bad da ki jingthung, kum ki niut ki nier, ki sla, ki soh, ki pai bad kiwei kiwei. Hynrei u jingthung u shna hi ia la ka bam na ka lyer bad na ki katto-katne ki met tynrai (**elements**) kiba ki ioh na ka khyndew, bad na ka um kaba ki ring na ka khyndew. Hooide, don katto-katne ki jingthung kiba im da ka jingbam kaba ki ioh na kiwei pat ki jingthung. Ia kiba kum kita ki jingthung la khot ki mangkariang (**parasite**).

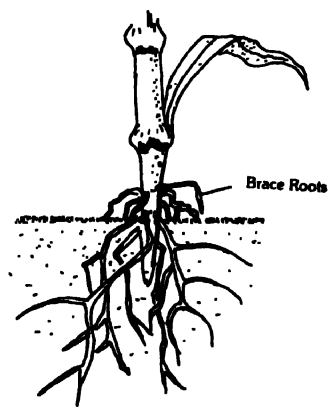
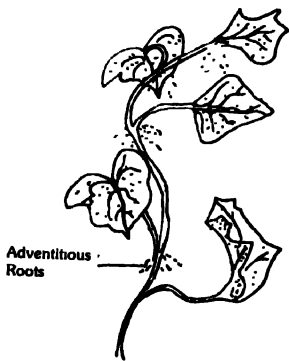
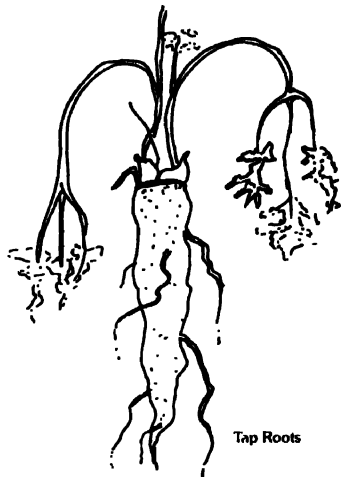
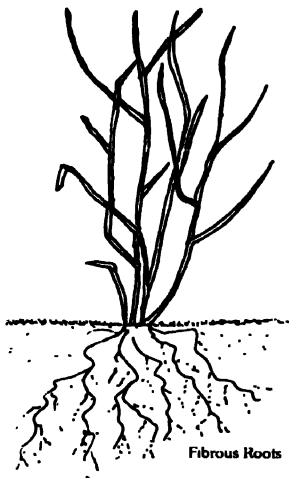
U jingthung u don hynniew tylli ki bynta kiba kongsan. Kita ki long kine : (1) ki thied, (2) ka met bah, (3) ki tnat, (4) ki sla, (5) ki syntiew, (6) ki soh, bad (7) ki symbai

### Ki Thied

Don bun rukom ki thied jong ki jingthung. Don kito kiba ka kam jong ki ka long ban pynskhem ia u jingthung, khamtam ia u jingthung ne u dieng uba kham met bah. Ia une u jait thied ki khot u **tap root**. Une u ngam beite shapoh khyndew bad bunsien u jrong lajan kat ka jingjrong jong ka met bah



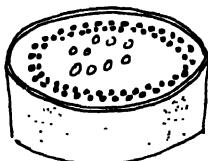
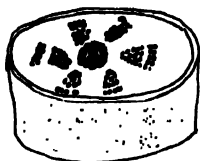
**Ki bynta bapher bapher jong u jingthung**



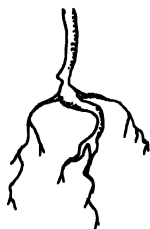
**Ki Jait Thied**

**Ki jing la pher ha pdeng u Dicot bad u Monocot**

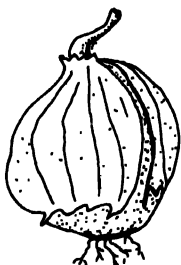
Monocot



Ki Met-bah

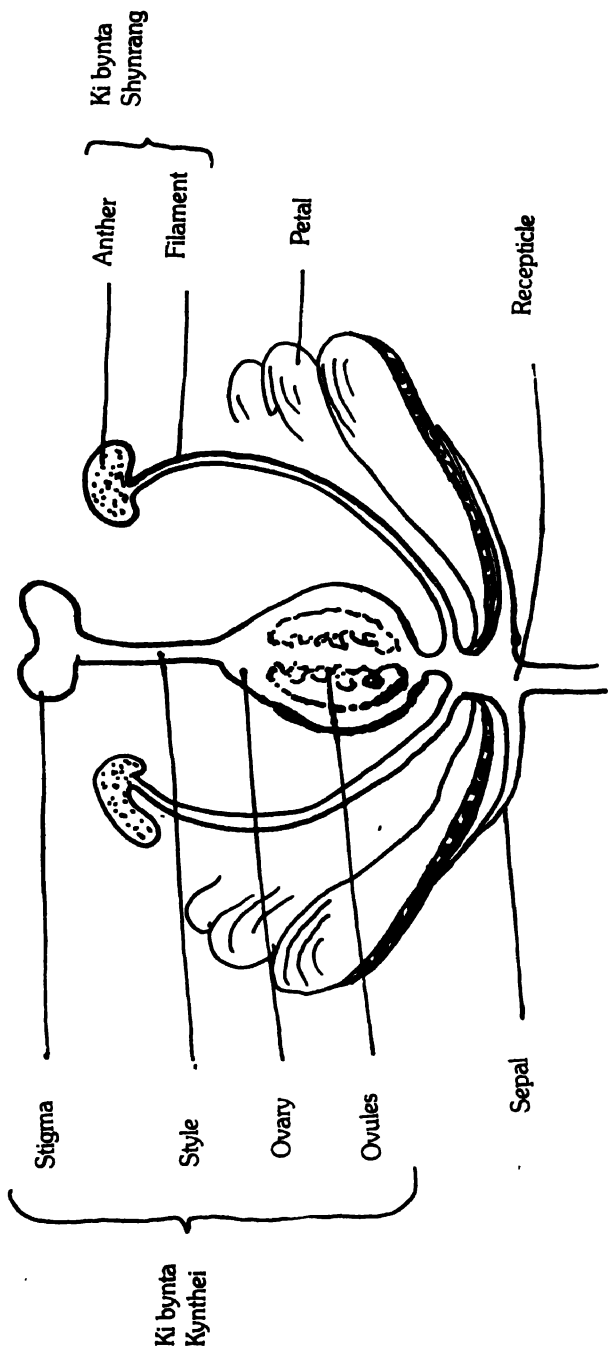


Ki Thied



Ki Sia





**Ki bynta bapher bapher jong u syntiew**

jong u jingthung halor khyndew. Lynda u thied u jrong kumta, kata u jingthung lane u dieng ha khlaw ruh u lah ban kyllon ha ka jingbeh ka lyer. Une u **tap root** u don ruh ki tnat syriem ia ki tnat u met bah jong ki diengbah.

Don kiwei pat ki jait thied kiba ngi ju shem ha ki kynja phlang, kum ha u kba, u kew, u riewhadem, u pai bad kiwei kiwei ki jingthung kiba long na ka jaid (**family**) jong ki phlang (**gramineae**). Ia kine ki jait thied ki khot ki fibrous root. Teng-teng ki jingthung kiba na ka jait ki phlang ki pynmih ki thied kiba kyrshan ia ki. Ia kine phi lah ban iohi ha u riew-hadem. Ia kine ki jait thied ki khot ki brace ne prop root (kata, ki thied kiba ai jingkyrshan ia u jingthung). Kine ki thied ki mih na ki mat jong u jingthung bad ki pynkynduh ialade ha ka khyndew. Ki don sa kiwei pat ki jait thied kiba shu mih bad ym da poi haduh khyndew, ki shu sah ha lyer. Ia kine ki khot ki **aerial** root. Hynrei kine ruh ha ki katto-katne ki jait dieng ki poi haduh khyndew bad ki sa long kum u dieng met hi. Kum kine ki jait thied ngi ju iohi ha ka jri ne ka dieng **banyan**. Kito kiba la poi ha ka Botanical Garden ha Calcutta ki la iohi ia une u diengbah uba ki thied jong u ki kyrshan ia ki tnat jong u.

Ka kam kaba kongsan jong ki thied ka long ban ring um na ka khyndew. Kane ka um ka tuid lyngba ka met-bah jong u jingthung lane u dieng bad ka mih pat na ki sla. Kane ka um ka long ruh kaba don bun jait ki jingbam kiba u jingthung u donkam; kumta kane ka bam ruh ka poi sha ki bynta baroh jong u jingthung. Kane ka jingbam kaba u jingthung u ioh na ka khyndew ka long kaba tang khyndiat eh. Kaba bun ka jingbam jong u jingthung ka long kaba u ioh na ka lyer kaba wan lyngba ki sla. Kane ka jingbam na ka lyer ka iasoh pat bad ka um kaba wan kiew na ka khyndew bad ka sa pynlong ia ka bynta kaba kham bun jong uno-uno u jingthung. Ki thied kiba ring ia kane ka um na ka bynta u jingthung ka wan pat lyngba ki thied kiba rit kiba la khot ki root hairs ne ki theid shñiuh. Kine ki don tang ha kaba kut eh jong kito kiwei pat ki theid kiba kham heh ia ki. Ia kine ki theid shñiuh lah ban pyni (**demonstrate**) da kaba buh katto-katne ki symbai riewhadem



ha ka kot shonsia kaba sngem bad sa tap ruh ia ki da ka kot shonsia kaba sngem. Kine ki thied shñiuh kin sa mih hadien katto-katne sngi. Dei kine ki thied shñiuh kiba ring ia ka um na ka khyndew kaba sngem, bad ym dei ki thied bah ne thied heh. Ka long kaba bha ban kynmaw ia kane namar haba ai um ia ki jhur kum ia u sohsaw lane ia ki dieng soh ruh, kam long kaba bha ban ai um ha ka trai dieng ne ha trai jong u sohsaw . Kane ka um ka lah ban kit ki khniäng jingpang bad kan wallam jingpang sha uta u jingthung ne u diengsoh. Dei ban ai um ha ka jaka (**zone**) ha kaba don kine ki thied shñiuh, kata ha tduh eh jong ki thied kiba kham heh ban ia ki. Haba phut ia uno-uno u jingthung khnang ban leit thung ia u shawei pat, ka donkam ban kynmaw bha ba ym dei ban pynsiew ia kine ki thied shñiuh, namar lada ym don maki, u jingthung un ym lah ban ring um na ka khyndew, bad kumta un iap stai.

## Ka Met-bah

Ki met-bah (**trunk**) jong ki jingthung ki iapher shibun ha ki bun rukorn. Ka met bah jong ki diengsoh kum u sohphan bad u sohpieng ki long da shisha ka met-bah kaba da kat ka met-bah. Namar ba kawei na ki kam jong ka met-bah ka long ban kyrshan ia ki tnat bad ki sla kiba don ha uno-uno u jingthung. Kumta ka met-bah ka dei ban long kaba khlain. Ngi iohi bun jait ki met bah jong ki dieng, kum ki diengbah ha khlaw, ki dieng bniap bad ki phlang. Hynrei wat ki phlang ruh ki long la ka rukom-rukorn. Don ki jait-phlang kum u siej kiba heh bha bad ka met bah ruh ka heh bad khlain. U pai ruh u long u jait-phlang uba khlain bad heh bun shah ia ki para-jait phlang. Hynrei kiba bun na ki jingthung kiba ngi rep ha ki lyngkha ki don ki met bah (**stems**) ki bym da khlain eh, kum u kba, u xew bad kiwei-kiwei. Kine ynda beh ka lyer ruh bunsien ki sylloñ noh. Ki jait-dieng bah ki don ruh ka snieh-dieng (**bark**), kaba iada ia ka met-bah. Ngi lah ban ithuh ia ka jait-dieng bunsien tang na ka snieh-dieng ne snep jong ka met-bah.

Hynrei ka kam kaba khraw eh jong ka met-bah (**trunk lane stem**) ka long ban kyrshan ia ki kynja thied (**veins**) kiba don na ka met-bah kiba kyntiew ia ka um bad ki jingbam jong u

jingthung na ka khyndew sha ka met-bah bad sha ki tnat bad ki sla jong u jingthung. Ka jingbam kaba u jingthung u shna ha ki sla pat ruh ka iaaid arsut sha ka met-bah bad shaduh ki thied. Kine ki tyndong (**conducting tissues**) kiba leh ia kane ka kam ki long kiba rit bha kum ki shñiuh.

## Ki Tnat

U kynja jingthung baroh uba jyrngam ki sla, la kumno kumno, u don pat ki tnat kiba mih na ka met-bah. Ka kam kaba kongsan eh jong ki tnat ka long ban kyrshan ia ki sla ha kata ka rukom ba kin ioh sngi.

## Ki Sla

Kaba bun eh ka jingbam ka ba don ha uno uno u jingthung. kham tam jong kito kiba jyrngam ki sla, la shna ha ki sla. Kato kaba jyrngam kaba don ha ki sla kaba ki khot ka klorophil (**chlorophyll**) ka shim ia ka bor na ka sngi bad ka pyniasoh ia ka kynja lyer (**gas**) kaba ki khot ka karbon dai-oksaid (**carbon dioxide**) bad ka pynkylla ia ka da ka jingkhleh bad ka um sha kiba bun ki jait jingbam kum u starch, ka shini bad kiwei-kiwei. Sa kawei pat ka kam jong ki sla ka long ban pynmih noh shabar ia ka um kaba u jingthung u ring da ki thied na ka khyndew.

Uwei pa uwei u jingshung ne u dieng u don la ki rukom rukom sla ki ba ia pher ha ka dur. Bun sien ngi lah ban ithuh ia u jingthung ne u dieng na ka dur jong ki sla ha u. Kumba ngi la ong haneng, ki sla bunsien ki don ka rong kaba jyrngam, hynrei teng teng ki don ruh kiwei pat ki rong kum kaba saw ba stem bad kiwei kiwei. Don bun ki dieng kiba duh noh ki sla ha ka por tlang. Ki dieng ne ki jingthung kiba ki sla jong ki ki sah baroh shi snem, la khot ki **evergreen**, hynrei kito kiba hap ki sla ha ka por tlang la khot **decidious**. Kine ki dieng ki sa mih sla thymmai ynda la syiaid ha ka por pyrem.

Nga ngeit ki nongpule ki kynmaw ba ha ki sla ki don ki thied kiba syriem ia ka snur thapbawa. Don ki jait sla ha kaba kine ki thied i kumba ki iathain (**netted lane dicot**) bad don ruh ki jait sla ha kaba kine ki thied ki long lynter-lynter (**parallel lane monocot**). Ki sla tympew, ki sla sohpyriam, sla sohphoh

bad ki sla jong kiba bun ki jingthung ki don ki thied ki ba long kum ka snur thapbawa, ka jar ne iarong, hynrei ki kynja phlang baroh ki don ki thied ki ba long lynter-lynter. Ha kaba kut kine ki thied, bunsien don i kynja khyrdop iba ngi lah ban iohi tang da kaba pundonkam da ka iit-tyndong ne **microscope**. Ia kine ki khyrdop ki khot ha ka ktien phareng ki **stomata**. Dei kine ki stomata ki ba pynmih noh ia ka um ka bym shim la pyndonkam da ki sla jong u jingthung ban shna jingbam.

## Ki Syntiew

Ia kiba bun ki briew ki syntiew ki long kiei-kiei kiba itynnad bad pynitynnad ia ka mariang; hynrei ki don ka kam kaba khraw ha kane ka pyrthei. Khlem ki syntiew ngin ym lah ban ioh ki symbai na kiba ngi lah pat ban nang pynroi shuh-shuh ia uta u jingthung. bad ngin ym ioh soh ruh. Hynrei ki dei ki symbai kiba ngi ioh khamtam na ki jait phlang kum u kba, u kew, u barli bad kiwei-kiwei ki jingthung, kiba long ki jingbam kiba kongsan eh ha ka pyrthei.

Don la kumno-kurnno san tylli ki bynta kiba donkam eh ha u syntiew. Ia ki bynta kiba habar eh jong u syntiew ki khot ki **sepal**. Kine ki long ki sla kiba rit, kiba ker ne iada ia u syntiew haba u dang lung. Kito ki bynta kiba pynitynnad ia u syntiew la khot ki **petal**. Ki rong kiba bun jait jong ki ki khring ia ki khniang, kum u ngap, ban leit sha ki. Katto-katne ki syntiew ki don ruh ka jingiwbihi kaba pynlong ia ki khniang ban leit sha ki. Nangta pat don ki bynta ha u syntiew uba ki khot ki stemen (**stamen**). Kine ki don u pui-pui (**pollen**) uba stem uba lada un hap halor uwei pat u bynta jong u syntiew uba ki khot u **pistil**, un iapoikha, u symbai bad u soh te kin sa nang-heh nang-heh ha u bynta jong u syntiew uba ki khot pat u carpel.

Don pat ki jingthung kiba don ar jait ki syntiew ha uwei u jingthung. Ngì pyniapher ia kine ki syntiew da kaba ong ba uta uba don uto u pui-pui (pollen) u dei u syntiew shynrang, bad ia uto pat uba don u pistil bad u **carpel** la khot u syntiew kynthei. Ki nongrep ki ithuh bha ia kine ki ar jait ki syntiew, kum kito kiba don ha u pathaw, lane u sohkha lane u peskot.

Lehse kin kynmaw ruh ba wat u riewhadem ruh u don ar jait ki syntiew: uto uba kum u symphiah u dei u syntiew shynrang bad uto uba don kito ki tmain (kito ki dei ki pistil) bad ki symbai kiba dang lung, u dei u syntiew kynthei. Ha u sohkynphor ruh ki don ar jait ki syntiew kiba ngi lah ban pyniapher da kaba jem.

Ha kane ka jingiapoikha ha ki jingthung kaba ki khot pollination ka donkam bunsien ia ka jingiarap ki khniang, kum ki ngap. Don pat ruh ki jingthung kiba ia kane ka pollination la iarap da ka lyer kum ha u riewhadem.

### **Ki Soh bad Ki Symbai**

Ynda uto u pui-pui (pollen) u la hap, kumba ngi la kdew haneng. halor u pistil, u carpel u la sdang ban nang heh haduh ba un da long soh, bad hapoh uto u soh ki don kito ki symbai. Don hateng hateng ki diengsoh ha kiba u soh u lah ban shu heh hi khlem da don kane ka jingiapoikha (**pollination**). Ka kam jong u soh ka long ban sumar ia u ne ki symbai kiba don hapoh jong u haduh ba kin da long kiba bit ban thung pat khnang ba kata ka jait jong uta u jingthung kan ym duh noh na kane ka pyrthei. Ki rong stem rong saw bad kiwei-kiwei ki rong ha ki soh ka iarap ruh ia kane ka jingpynphriang ia ki symbai jong kito ki soh, namar kine ki rong ki iarap ia ki sim ki mrad bad ia u briew ruh ban leit kheit ia ki bad ban leit rah kylleng-kylleng ia ki.

Ki symbai dieng ruh bad jong ki ñiut-ki-ñier ki iapher ha la ki dur-ki-dur. Kito kiba donkam ia ka jingiarap ka lyer ban kit ia ki sha jngai ki lah ban don kum ki thapniang kiba kit ia uta u symbai kham sha jngai, kum ki symbai kseh. Ki don ki ñiut kiba ki soh bad ki symbai ki snoh ha ki jain u briew lane ha ki shñiuh, ha ki snieh ki mrad, kum ki sohbyrthit, bad kiwei-kiwei. Ki don pat kiba ki soh ryngkat bad u symbai, kum ha u jalynñiar ne dandelion kiba don kum ka parachute khnang ba ka lyer ka lah ban kit ia ki kham jngai.

Kəwei na ki kam kiba u nongrep u leh ha ka kam rep jong u ka lǝng ban thiew ñiut. Lada u nongrep u kynmaw ba ki ñiut

bunsien ki long na ki symbai kiba hap halor ki lyngkha jong u  
un kham sumar ban ym shah ia ki niut ba kin heh haduh ba  
kin da bet symbai. Hooïd, don ki niut kiba long na ki bynta  
jong u jingthung kiba don hapoh khyndew kiba ki khot ki  
rhizome ne ki runner. Ia kine ruh dei ban weng noh katba lah  
ha ka por ba pynkhreh ia ka khyndew ban thung kino-kino ki  
jingthung hangta.

## LYNNONG 3

### KI JAIT JINGTHUNG KIBA KHAMBHA

Ki jingthung kiba mynta, ki la mih na ki jingthung kiba mih ha khlaw ne ha ki lyngkha phlang. Ki nongrep ha kylleng ka pyrthei ki la jied pat na ki jingthung kiba mih ha kper ne ha lyngkha jong ki ia ki jait jingthung kiba kham bha. Kumta ha ki hajar bad ki spah snem kiba la leit, u nongrep u la lah ban pynmih (**evolve**) ym tang ki jingthung kiba pher ba pher na ka bynta ban pynmih ki jaid jingbam kiba pher-ba-pher, hynrei hadien haiden ki la lah ruh ban pynmih ki jait jong uta u jingthung hi kiba nang khambha-khambha (**improved varieties**). Kumta u nongrep ha kaba nyngkong u la lah ban pynmih u kba na uba u lah ban ioh ia u khaw uba bit ban shet bad ban bam, hynrei hadien hadien u la nanglah ban pynmih bun jaid ki kba kiba khambha na ka bynta ka jaka jong u lane uba kham bang ia u ban bam. Ha kane ka rukom la mih bun jait ki jaid kba ha ka pyrthei. Don lehse mynta ym duna ia ka 10000 ki jait kba (rice varieties) ha ka pyrthei. Ha kajuha ka rukom don ruh bun ki jait phan ha ka pyrthei baroh kawei. Bad ka long kumta ia kiwei-kiwei ki jingthung ruh. Ki riewstad ki la nang ialeh ban pynmih ki jait (variety) kiba nang kham bha-khambha ha man la ki jaid jingthung kiba ngi don ha la ka ri ka ri.

Kawei ka rukom kaba ki nongrep ki ju leh ka long ban jied ia u jingthung uba bha tam katba ki lah ban bishar ha lyngkha bad ban buh symbai da uta u jait na ka bynta ban thung ha ka snem kaba bud. la kane ka rukom ban pynroi ia u jait jingthung uba kham bha ki khot ka **pedigree method**. Lada shu jied pat na kiba bun ki jingthung tang ia kito kiba kham bha bad buh symbai na ki, ia kata ka rukom jingjied ki khot **mass selection**. Kane ka rukom ban buh symbai kaba ar ka long lehse kaba kham jem bad kaba u nongrep u lah ban leh bad ju

leh ruh. Katei kaba nyngkong ka shim por bad lehse ka bha ba ia kane yn leh da ki saiantis (scientist) ka Sorkar.

Kawei pat ka rukom kaba ki riewstad ki ju leh ban ioh da ki jait jingthung kiba kham bha ka long da kaba wad jingtip na kano ka ri ne ka thain jong ka pyrthei uta u jingthung u wan. Ki leh ia kane namar ba ki tip ba ha ka jaka ha kaba u mih nyngkong eh uno-uno u jingthung hangta ki don bun jait ki jaid jong kito ki jingthung na kiba ki lah ban jied. Ki la leh kumta na ka bynta u phan. Namar ba ki tip ba u phan u la mih nyngkong eh ha ki lum Andes ha South America, kumta ki la phah ia ki scientist jong ka rep ban leit wad ia ki jait phan kiba iapher uwei na uwei. Ha ri India ia kiba kum kine ki phan la leit thung ha ki lum Simla bad na kita ki la ialeh ban pynmih ki jaid phan kiba khambha bad kiba lait na kiba bun ki jingpang jong ki phan.

Nalor kitei ki rukom kiba la ju pyndonkam ban pynmih da ki jait jingthung kiba kham bha, ki riewstad mynta ki la pyndonkam ruh ia ka jingpyniapoikha ia uwei u jingthung uba bha ha kano-kano ka liang bad uwei pat uba kham bha ha kawei pat. Kum ka nuksa, uwei u jaid jingthung u lah ban long uba sohba bad uwei pat u lah ban long uba lait na kano-kano ka jingpang kaba ju pynjulor ia kita ki jingthung jong kata ka jaid. Ha kane ka ri ki la leh kumta ia u pai (sugar cane), bad ki la pynmih kumta bun jait ki pai kiba iadei bad ki bynta kiba iapher-iapher jong kane ka ri. Ka kane ka rukom ki khot **hybridisation**. Ka Sorkar ka la jied ia ka shnong Coimbatore kaba sha South India na ka bynta ban pynmih kumta ia ki pai kiba nang khambha-khambha. La jied ia ka Coimbatore namar ka long ka jaka kaba syaid bad ki pai hangto baroh ki phuh syntiew. Ka jingiapynpoikha ia ki jingthung ka long, kumba la ong kham shakhmat da kaba wan rah da ki pollen na uwei u syntiew bad buh pat ha u pistil jong uwei pat u pai. Teng-teng ki la pyniapoikha hapteng u pai bad u siej lane kiwei pat ki jingthung kiba dei hi ki kynja phlang khnang ban pynkhlain ia u pai.

Hangne ha Meghalaya ki nongrep ki la ju iohsngew ia uta

u **hybrid maize** (u riewhadem shiteng jait). Ia une u riewhadem ruh ki riewstad ki pynmih da kaba pyniapoikha uwei u riewhadem uba bah khun shibun bad uwei pat ruh uba khlain bad bah khun shibun. Kane ka jingpyniapoikha ka shim por shibun namar dei ban da jied bha ia ki kmie ki kpa (parents), bad ynda la ioh ki khun kiba mih nangta la dei pat ban da khmih la ki long ne em kiba kham bha ban ia kita ki kmie ne ki kpa. Kane ka jingpyniapoikha bunsien hagdeng uwei u jaid riewhadem bad uwei pat ki pynmih ki khun kiba kham khlain ban ia ki kmie ki kpa. Ia kita ki khun kiba mih nangta ki khot ki **hybrid**. Ha ri America kumba 80 haduh 100 ha ka shispah ki riewhadem ba ki thung ki dei kine ki hybrid maize. Namar ba ia u pollen la kit da ka lyer, kumta khnang ba uno-uno u jaid riew hadem uba la jied kum u kpa lane kum ka kmie dei ban thung jngai na kiwei pat ki jaid riewhadem ba yn ym don ka jingiakhleh bad kiwei pat. Ia kane ki khot da ka ktien phareng **isolation**. Kane ka jingpynia jngai ne isolation ka pher na uwei u jingthung sha u wei pat.

Ngi kyrmen ba ki Sorkar kin wad lad ban pynphriang ia ka jingthung riewhadem da une u hybrid maize, kumba ki leh ha America bad kiwei-kiwei pat ki ri ha kaba ka jingrep ka la nangiaid sha phrang. Ia kane ka kam dei ban leh hi da ka Sorkar, namar ba ym lah ban buh symbai da ki khun jong une u hybrid maize.

Kitei ki rukom kiba ngi la kdew haneng ki long kiba ki ju pyndonkam ban pynmih (evolve) ki jingthung kiba kham bha na ka bynta ka rep lum bad rep pynthor. Hynrei ha kaba pynmih ki jaid soh kiba kham bha pat la ju kham pyndonkam da kito ki rukom kiba ki khot kaba bod (**budding**) ne kaba krap (**grafting**), lane da ksba shu kolom (**layering**) la kine ki rukom ban pynbha ia ki jaid diengsoh yn sa batai kham bha ha ki lynnong kiba shadien.



## LYNNONG 4

### KA SUIÑ BNENG BAD KA REP

Ka jinglong jong ka suiñ bneng (**climate**) , ha ka liang ka jingshit, jingkhriat, u slap. ka jingrong ne jinglyngkot ka sngi, ka ktah shibun eh ia u jingthung bad kumta ruh ia ka rep ka riang. Ka jingbha jong ka rep ka riang ka shong eh, nador kiwei kiwei, halor ka jinglong jong ka suiñ bneng. Ban pynkylla ia ka suiñ bneng katkum ka jingkwah jong ngi ka long kaba shitom shibun. Namar katta ngi dei ban pyniahap ia ka rukom rep jong ngi bad ka jinglong ka suiñ bneng ha la ki jaka jaka la jong. Dei na kane ka daw ruh ba ngi hap ban da sngewthuh shai ia ka jinglong ka suiñ bneng khnang ban lah ban pynbha shuh shuh ia ka rep ka riang jong ngi.

Ka Jylla Meghalaya ka long kawei na ki jaka ha pyrthei kaba jur bha u slap hynrei ka jingiapher halor ka jingshit jingkhriat jong kawei ka bynta na kawei pat ka iar shibun. Ka jylla hi ka don ka jingiapher ha ka jingshit (**temperature range**) naduh 20°C haduh 36°C. Shaphang ki thain rilum Khasi ki ba jrong kumba 600-2000 mitar na ka sla jong ka duriaw (**mean sea level**) ka suiñ bneng ka long kaba khriat. Ki bynta ba hapdeng ki ri thor bad ri lum pat ki long ki ba kham syaid bad ki ri thor jong ka Meghalaya ki dei ki bynta ki ba shit. Dei na kane ka jingiapher jong ka suiñ bneng na kawei ka bynta sha kawei pat ba phin shem ruh ka jingiapher ha ki jait jingthung (**vegetation**). Kumba shu ai nuksa phin shem ba ki dieng kseh kiba iadei ha ki jaka ba kham khriat ki long bha ha rilum Khasi bad ki dieng sal kiba lah ban kham shah ia ka jingshit ki mih sha ri Bhoi.

#### U Slap bad ka rep ka riang.

U slap u long u ba donkam eh na ka bynta ka rep, bad ha Meghalaya hi haduh mynta ngi dang shaniah beit tang ha ka um slap na ka bynta ka rep ka riang jong ngi. Ha kawei ka

liang ngi long ki ba donbok shibun namar ba ka jylla hi baroh kawei ka ioh bun ia u slap hynrei ynda ngi peit pat na kawei ka liang ngi dang long ki ba sahdien shibun namar ba ngim pat nang ban pyndonkam ia ka ha ka rukom ka ba dei ia ka um ba ngi ioh na u slap. Ha Meghalaya ngi ioh slap ym duna ia ka 5000 mm bad ka lah ban poi ruh sha ka 15000mm ha ka shisnem bad lada ngi la nang ban pyndonkam bha ia kane ka um slap ka jylla jong ngi kan nym shitom ei ei ha ka liang ka um bad ka rep ka riang jong ngi ruh kan jin da la nangkiew. Ka Sohra ka dei ka shnong ka ba jur eh u slap ha ka pyrthei hynrei ha ka por pyrem pat ka dei kawei na ka shnong ka ba shitom um eh — wat tang ka um bam um dih ruh ym ioh bha ia ka rep lei lei te yn nai ia kren. Mynta ki por ngi shem ba ka jingioh ia u slap ka la nang duna duna namar ka jingpom pathar ia ki dieng ki siej bad ki khlaw ki btap bad ka la dei hi ka por ia ngi ban pynkhe im biang ia ki khlaw ki jong ngi khnang ba ngin ioh pahuh biang ia u slap u ba ai jingim ia ngi.

### **Ka jingshit jingkhriat**

Ka jingshit jingkhriat (**temperature**) ruh ka dei kawei na ki bynta jong ka jinglong ka suiñ bneng ka ba ktah ia ka rep ka riang. Ka jing sngewthuh jong ngi ia ka jingshit jingkhriat jong ka jaka kan iarap ia ngi ban jied ia kito ki jingthung ki ba iadei bad ka to ka jaka khnang ban ngin ioh ia ka jingmih kaba biang.

### **Ka sngi**

Ngi dei ban sngewthuh ba lada slap eh ruh ym long bad lada rkhiang eh ruh ym long. Ngi donkam shibun eh ia ka sngi (**sunshine**) ha ka rep namar ba lada shu slap sah lane dum lyoh sah, u jingthung un ym lah ban shna ia ki jingbam kiba u donkam lyngba ka **photosynthesis**. Lada ym ioh sngi ka jingsngem jong ka lyer bad ka jaka ruh ka jur bad kane ka wallam ia bun jiad ba ki jingpang ki ban pynsniew ia u jingthung.

### **Ka Lyer**

Ka lyer ruh ka long ka ba donkam bha ia ki jing thung

namar kane ka iarap ia ka jingiapoikha ki jingthung (**pollination**) hynrei lada palat eh ka pynsniew ia ki jingthung naba ki pat noh lane hap noh ki syntiew ki soh.

Kitei ki jingthoh haneng shaphang ka jingiadei ka suiñ bneng bad ka rep ka riang ka long tang kiba la shu kdew lyngkot bad lada ngi don hi ka jingthmu ban kham pynkiew ia ka rep ka riang jong ngi, ngi dei ban da pynshitom ialade khyndiat ban wad jingtip shuh shuh khamtam lei lei ha ka pyrthei saian mynta.

## LYNNONG 5

### KI JAID KHYNDEW HA MEGHALAYA

Namar ba ka khyndew ka long kawei na kiei-kiei kiba ngi pyndonkam eh ha ka rep, kumta ka donkam ban sngewthuh katba lah ia ka khyndew bad ia ka jingiapher jong kawei na kawei pat. Ha kaba nyngkong ka bha lehse ba ngin sngewthuh ba ka khyndew kaba ngi rep mynta ha ki lyngkha jong ngi kam shym long kajuh ha ki hajar snem ne wat ki spah snem kiba mynshuwa. Ka la shim por bun-bun snem ba kan long kumba ka long mynta.

Kawei na kine ki khyndew kiba ngi don mynta ha ki lum, ki lyngkha bad ki pynthor jong ngi ki lah ban long kito kiba la kylla khyndew na ki maw bad ki mawsiang kiba don hapoh jong ki. Ia kine ki jaid khyndew ki ong ki **residual soils**. Ki jingthung kiba mih nyngkong eh ha ki mawsiang ki long kito kiba shu ai rong lieh, saw, ne jyrngam ha uno-uno u mawsiang. Kito ki long ki jingthung kiba rit kiba ha badei badei ym lah ban iohi ia ki marwei-marwei da ki khmat, hynrei kiba ngi lah ban iohi da ka iit tyndong kaba pynheh ia ki kaba ki khot ka microscope. Kine ki dei ki **bacteria** bad ki **fungi**, kiba lah ban im bad nangroi haba ki hap ha kano-kano ka jaka kaba ailad ia ki ban roi. Kine ki lah ban pynkylla ia ki maw bad ki mawsiang sha ka khyndew kaba bit ban thung jingthung ynda ki la trei kumta da ki hajar bad ki phew hajar snem. Kum kine ki khyndew ki long kiba ngi ju shem ha ki lum lane ha ki lum madan (**plateau**) ha Meghalaya. Kine ki khyndew kim da long kiba da sboh eh, namar ki jingbam kiba u jingthung u donkam (**plant nutrients**) kiba ki ki don, ki long tang kito hi kiba la ju don ha uta u maw ne u mawsiang, bad na ki niut ki nier bad ki jingthung kiba la ju long halor jong ki ynda ki la pyut. Ka jingsboh lane ka jingseisoh jong kine ki khyndew ka shong eh shibun ha ka jingbun jong kane ka pyut ka syar na ki niut ki nier bad ki jingthung kiba la mih halor jong ki. Ynda haba

kane ka pyut ka la bun, ka khyndew bunsien ka la nang kham iong kham iong. Katba ka khyndew iong ka nang rben katta ruh ka nang kham sbob bad kham long kaba seisoh.

Kawei pat ka jaid khyndew kaba ngi ju shem ha Meghalaya hajan jong ki jaka riat ka long kaba ki khot ha ka ktien phareng ka **colluvial soil**. Kane ka long ka khyndew kaba la shu hap mian pa mian namar ka jingkhia jong ka hi. Ngi iohi ia kine ki jaid khyndew ha ki thain Riwar. Kane ka khyndew ka iapher na katei kaba haneng, ka residual soil, namar ba kam shym sah hajuh hynrei la pynkynriah ia ka da ka jingkhia jong ka. Kane ka khyndew ka kham long khyndew maw lane ka khyndew kaba la iakhleh bad ki maw; kumta ka long ka khyndew kaba ka um ka ngam bha ha ka (**well-drained**). Kane ka khyndew ruh kam da long kaba seisoh bha, lymda ka long ka khyndew ha kaba ki dieng ki siej ki la shu mih hangto da ki bun bun snem khlem pynkhih ia ki (**virgin soil**). Ka jinglong phrew-phrew jong kine ki jaid khyndew ka iarap ruh ia ka um ban nym neh ha ka hynrei ban ngam sha kaba jylliew jong ka khyndew. Bun eh na ki jaid jingthung ba ngi thung ha ki kper bad ki lyngkha kim sngewbha ia ka khyndew ktieh, lane kano-kano ka khyndew ha kaba ka um ka sah hajuh. Kum kine ki khyndew ha Meghalaya ki long kiba bit ban thung diengsoh lane kino kino ki dieng kiba heh kiba ym donkam ban da pynkhih ia ka khyndew kaba don hapoh jong ki. Kim long namarkata ban thung ia ki jingthung kum u phan, u riewhadem bad kiwei-kiwei kiba donkam ban kynroi ia ka khyndew bunsien ha ka shi aiom.

Ki don pat kiwei ki jaid khyndew kiba kham bun eh ha ri Dkhar, hynrei hangne ha Meghalaya ki don tang ha ki madan kiba harud jong ki wah bad ki wah bah. Kine ki long ki khyndew ba la wan buh da ki wah bad ki wah bah. Ia kane ka jaid khyndew ki khot ka **alluvium** lane ka **alluvial soil**. Kine bunsien ki long ki khyndew kiba seisoh bha; namar ki long bunsien ki khyndew kiba la kit da ka um slap na ki lum, ki ranab lum lane na ki khlaw ki btap. Namar ba ka khyndew kaba halor eh jong ka sla khyndew ka long kaba bha na ka

bynta ki jingthung, kumta kane ka .khyndew ia kaba la kit da ka um ka long kaba seisoh. Kane ka khyndew ka la iakhleh ruh bad bun kiwei-kiwei pat ki symboh khyndew. Kine ki khyndew ki long kiba rew (coarse) haba ki don kham shajan jong ka tlong jong ka wah; hynrei katba ki nangjingai ki long kiba kham ni. Hynrei bunsien ki lah ban long kham rew ha kawei ka syrtap bad kham ni ha kawei pat, bad kumta ter-shi-ter. Kane ka long kat kum ka jingkhlain jong ka um kaba wan bret ia ka khyndew na kawei ka por sha kawei pat. Ka um kaba kham lat-lat ka buh tang ia ki symboh khyndew kiba kham rew, hyndrei ka um kaba iaiaid suki ka iehnoh ia ki symboh khyndew kiba kham ni. Ha kine ki alluvial soil la ju rep da u kba lane uno-uno u jingthung uba long bha ha ki pynthor. Ha ki jaka kiba kham duna u slap pat kum ha Punjab, ha Uttar Pradesh bad kiwei-kiwei ki jylla kiba shaphang shatei lam sepngi, ki thung bun jait ki jingthung kum u kew, u barli, u phan, bun jait ki jhur, ki dai, u pai bad kiwei-kiwei. Kine ki jaid khyndew ki long kiba da bit bha ban thung bun jaid ki jingthung.

## LYNNONG 6

### KI JINGBAM JONG U JINGTHUNG

Ka jingbam kaba bun eh jong u jingthung ka wan na ka lyer bad ka um. Ha ka lyer ka don ka kynja lyer (gas) kaba ki khot ka carbon dioxide kaba long ka bih ia u briew bad u mrad ruh hynrei kaba u jingthung u pyndonkam ban tei ia la ka met. Kane ka gas ha ka jingshisha ka long kato kaba u briew bad u mrad hi ki pynmih na ka jynhaw; ka dei ruh kato kaba mih na ki motor kiba bun jaid ha kane ka pyrthei. Kane ka la don lypa ha ka lyer, kumba don ka oxygen bad ka nitrogen bad kiwei-kiwei ki gas. Ka um pat ka rung ha u jingthung na ki thied jong u. Da ka jintrei baphylla jong u jingthung kane ka carbon dioxide ka iakhleh bad ka lyer kaba rung ha ki sla da kita ki thliw kiba rit kiba ngim lah ban iohi da ki khmat, kiba ki khot ki **stomata**. Kine ki stomata ki long syriem ia ki shyntur u briew hi. Haba kine ar ki iakynduh ha ka sla kaba jyrngam, ki kjat sngi da ka jingiarap jong kato kaba jyrngam ha ki sla, kaba ki khot ka **chlorophyll** ki pyniasnoh ia kito ar (ka um bad ka carbon dioxide) bad ka pynkylla ia ki sha u starch lane ka shini bad kiwei-kiwei ki jait jingbam kiba u jingthung u donkam ban tei ialade. Ia kane ka rukom shna jingbam u jingthung ki khot ha ka ktien phareng ka **photosynthesis**. Kumta ka jingbam kaba u jingthung u ioh na ka khyndew ki long tang khyndiat eh. Hynrei kine ki jingbam kiba wan na ka khyndew ki long kiba donkam katta-katta ba u jingthung um lah ban long khlem ma ki.

Ki jingbam kiba wan na ka khyndew na ka bynta u jingthung ki long ka **nitrogen**, ka **phosphorus**, ka **potassium**, ka **calcium**, ka **sulphur** (kyndok), ka **iron** (nar) bad ka **magnesium**. Kine ki hynñiew ki met tynrai, ryngkat bad kiwei pat (lai) kiba wan na ka um bad ka lyer (ka **oxygen**, ka **hydrogen** bad ka **carbon**), ki long kiba u jingthung baroh u donkam khnang ba un san bad un heh. Nalor kine ki 10 ki met

tynrai kiba u jingthung u donkam eh, don shuh-shuh sa kiwei pat kiba u jingthung u donkam kham khyndiat. Kine ki met tynrai ki long ka **manganese**, ka **zinc**, ka **boron**, ka **copper (tama)**, ka **chlorine**, ka **cobalt** bad ka **molybdenum**. Ia kitei hynniew kiba donkam kham bun la khot ki **macro-nutrients**, bad ia kito hynniew kiwei pat kiba donkam kham khyndiat, bad kiba don ruh kham khyndiat ha ka khyndew la khot ki **micro-nutrients**. La kumta ruh ka jingiapher hapdeng ka iron (ka nar) bad ka manganese ka long lajan kumjuh hi. U kba (rice) uba shu antad, kata u bym da mih bha eh u lah ban donkam kumba shi kilo ka nar bad shi kilo ka manganese na man la shi hectare ka khyndew.

## Nitrogen

Ki khyndew rep jong ngi ha Meghalaya ki long kiba duna shibun ka nitrogen. Kane ka long kaei-kaei kaba phylla haba ka nitrogen ka long ka kynja lyer (gas) kaba don baroh sawdong ia ngi. Ka nitrogen bad ka oxygen ki long ki bynta kiba bun eh ha ka lyer; ka nitrogen ka don haduh 78 bynta na ka shispah bad ka oxygen ka don 21 bynta. Kumta kine ar ki long kumba 99 bynta na ka lyer. Kiwei pat kiba don ha ka lyer ki long ka carbon dioxide (tang 0.03 per cent). ka argon, ka hydrogen bad kiwei-kiwei. Kumta ka nitrogen kum ka lyer ka don hi ha ka khyndew ruh ha ki thliw (**pores**) kiba don hapdeng ki symboh (**particles**) jong ka khyndew. Hynrei khnang ba kan long kaba u jingthung u lah ban pyndonkam, ka dei ban da iasnoh bad kiwei pat ki met tynrai kum haba ka iasoh bad ka potassium bad ka (nitrogen) bad pynlong ka potassium nitrate, ne ha kaba ka iasoh bad u sodium bad ka nitrogen ban pynlong ka sodium nitrate. Ka nitrogen ka lah ban iasoh bad kiwei kiwei pat ki met tynrai bad kiba lah ban long ki jingbam jong u jingthung. Hynrei namar ba kine ruh kim da biang eh, la donkam ban ai da ki sbob bad ki sbob dawai kiba don ka nitrogen. Ngin kdew hangne harum ia ki katto-katne ia kito kiba iah ban ai ha ka khyndew ban pynroi ia ka nitrogen.

Ka eit ki mrad baroh ka long kaba don bun ka nitrogen. Ka eit masi, ka eit kulai, ka eit sniang, ka eit langbrot ne eit blang,



ka eit syiar, bad ka kai bri (**night soil**). Hynrei ka jingbha jong kine ki sboh baroh ka shong shibun eh ha ka rukom ba ngi buh bad sumar ia ki. Ka eit masi kaba la pynlang bad ka um jung masi ka long kaba kham bha shibun (kata, kaba kham bun ka nitrogen) ban ia ka sboh masi ha kaba ym shym la sumar ban pyndonkam bad ka um jung masi artad. Ka um jung masi ka don kumba arshah ka nitrogen ban ia ka eit masi; hynrei namar ba ka eit masi ka bun kumba arshah ia ka um na ka masi kumta lada pyniakhle lang ia ka sboh eit masi ka kham bha haduh ar shah ban ia ka sboh masi ka bym shym don kane ka um na ka masi.

Kawei na ki rukom kaba ki ju leh ban sumar ia ka eit masi ka long da kaba ki shna ka **compost**.

Katba nang ia id ka por bad ki snem, ka jing pyndon kam ia ka sboh ieit kaba ngi ioh na ki jing ri ka la kham kiew namar ka rep ka riang ha ka Ri Khasi Jaintia jong ngi ka la nang kham khraw. Ka dei ruh imat ba ma ngi kum ki nong rep ngi sngew thuh ba ngin ym lah ban pynmih ia uno uno u mar rep u ban pynioh jingmyntoi khlem da pyndonkam ia katei ka shoh.

Haba peit kumba ia id ka iew mynta ha ki bnai tlang, shi trok lane kumba shiphew ne shiphew ton shiteng ka sboh masi ka shong dor haduh kumba lai hajar phra spah haduh saw hajar tyngka - Bad bunsien ka daw kumba long ha ki ri jong ngi ka dei namar ba ka jngai eh ka jaka ri masi na ki jaka rep. Kane ka long ka jingkit ka ba khia bad ha ki khep ki khep ka ju pyndiaw mynsiem ia u nongrep, khamtam haba u thmu ban pynsan ia la ka jingtrei.

Ban lait na kine ki jing eh, ki don ki lad ki rukom ban shna lane pynkhreh ia ki sboh, da kaba pyndon kam da ki phlang ki niut hi kynbat bad ki jingthung ba la kyntiat, kaba ka khyndew jong ngi ka don kam, ban heh ka rep ka riang, bad ban pynduna ia ka lut ka sep haba shu thied ia ka sboh kaba mih na ki jing ri. Ia kane ka rukom shna lane pynkhreh ia kane ka sboh ki khot ka **composting**.

Ngi tharai ka aiom kaba bha eh ban pynkhreh ia kane ka compost hangne ha Ri Khasi Jaintia ka long ha ki por shiteng snem kata ha ki bnai June -July. Ka dei ka por ha kaba ki phlang ki ñiut bad kiwei kiwei ki jyntang jingthung ba la kyntait ki pahuh bha bad dei ruh ka por ba kine ki ñuit ki pyut khloi.

Ngi dei pat ban jied ia ka jaka kaba kham hajrong khnang ba kan ym lang ka um slap. Kane ka jaka kam dei ban jngai ruh na ka um (**water source**). Hangta tih ka thliew kaba jylliew kumba 2 phut haduh 3 phut (60-90cm) ka pynkiang, ka dei ban long la kumno kumo 7 phut (210cm) bad ka lynter jong ka kumba 10 phut. (300 cm) Nangta sa sdang pyndap ia kane ka thliew da ki ñiut ki phlang ki jingtang jingthung ba la kyntait bad kiwei kiwei . Ia u kymbat u ba kham jwat dei ban da shain shuwa ban pyndap ha ki 'liew sboh. Phriang syrtap haduh ban da dap kumba 6 inch (15 cm) bad nalor kane sa ber da ka sboh eit kaba dang im jong kino kino ki jingri kumba shi inch eiei lane lah ban ber ruh da ka urea. Ngi leh kumne khnang ba kito ki jingthung kiba rit ki ba don ha ka sboh jingri ki pyn pyutkloi ia kito ki niut. Iai leh kumtei, shi systap ki ñiut ki phlang shi syrtap ka sboh jingri, haduh ba kan da dap ka 'liew sboh. Pyntam ia kane ka jing syrtap haduh kumba shi phut shi phut shi teng na ka sla khyndew bad nangta sa set sbak ia ka da kaba lape najrong da ka sboh jingri kaba la khleh lang bad u khyndew.

Ia kane ka sboh ba la shna kumne lah ban pyndon kam ynda la dap 100 haduh 150 sngi. Sha ki jaka ba kham syiad ka kham pyut kloi ban ha ki jaka kiba kham khriat. Ha ki jaka ki ba kham khriat haba ka jingpyut jong kine ki nuit ka kham suki, dei ban da ai um hateng hateng ha ki por bym ioh slap shuh.

Kito ki nongrep ki ba rep kham bun, ki lah ban shna kham bun tylli kum ki ne ki 'liew sboh (**compost pit**) bad ban pynduna ka por ka bor haka kit ka bah, ki lah ban shna ia ki sha jan ki lynkha ne pynthor jong ki.

Kawei pat ka rukom kaba ngi lah ban leh ban pynroi ia ka nitrogen ha ka khyndew ka long da kaba thung ki jingthung

kiba lah ban pyndonkam ia ka nitrogen kaba don ha ka lyer na ka bynta jong ki hi. Kiba bun eh na kito ki jaid jingthung kiba lah ban leh kumta ki dei kito ba ki khot ha ka ktien phareng ki **legumes**. Kine ki dei ki kynja ri ne rymbai. Ki syntiew jong ki bunsien ki long ha ka dur ka thapbalieh (**papilionaceous**) bad ki soh jong ki ki long ha ka dur jong u ri. U rymbai ktung, u rymbai ja, u motor bad bun kiwei-kiwei pat ki dei kine ki legume. Ia kine ki jingthung kiba na kane ka juh ka iing-kur (**family**) lada phin tih sumar bad peit ia ki thied jong ki, phin shem ia ki kynja sohkhlot (**nodules**). Ha kine ki soh-khlot don da ki lak bad ki phew lak ki jingthung kiba rit (bacteria) kiba lah ban shim ia ka nitrogen na ka lyer; kumta kine ki sohkhlot hi ki long kiba dap da ka nitrogen, hynrei uta u jingthung ha kiba ki mih ruh u long uba bun ka nitrogen. Ka jingtrei kaba phylla jong kine ki bacteria ka long ba ki ai ia kane ka nitrogen ha u jingthung, bad ki pat ki shim ia ka bor (**energy**) na ka jingbam kaba ki bacteria ki ioh na uta u jingthung, kum ia u starch ne ka kynja **carbohydrate**, bad da kata ka bor hi ki wallam ia ka nitrogen ha ki jingthung. Kumta kito ki sohkhlot kiba kum ki thapbasim ki long ki karkhana ban wallam ia kane ka fertilizer (jingbam) kaba ki jingthung bad ki mrad baroh ki donkam. Ia ki jingthung kiba ki da thung khnang na ka bynta kane ka nitrogen ki khot ki green manures. Ha ri dkhar kum ha Uttar Pradesh, Bihar bad kiwei-kiwei ki jaka ki shait thung khnang da u saihon (**sunh-hemp**) . Ha ki jaka kiba kham bun u slap kum ha W.Bengal ki shait thung da u dhaincha (**Sesbania aculeata**). Ki kynja dai, ne ri, ne rymbai baroh ki long kiba bit ban pyndonkam ha kane ka rukom. Don ruh kito ki bym dei ki legume kiba lah ban pyndonkam kum ki **green manure**, kum u rai (kynja tyrso-**Brassica juncea**) lane wat u syntiew cosmos ruh lane kino-kino ki jingthung kiba mih kloj, kiba jem (**succulent**). Ha ri Bhoi u jingthung uba ki Assamese ki khot u bogamedoloo (**Tephrosia candida**) u lah ban long uba bit ban pyndonkam ha kane ka rukom. Ia une u bogamedoloo ha ki kper sha, ki thung ryngkat bad u dieng sha bad hadien lai snem u sa duh noh lane ki pom noh ia u.

Ia kine ki jingthung kiba ngi mut ban pynlong sboh dei ban thung ha ka por ba dang shu hap slap malu-mala, bad ynda hadien kumba lai bnai, pyndem ia ki bad sa lur, da kaba tap lane iakhleh ia ki bad ka khyndew.

Kaba ai da ka sboh dawai ka long kawei pat ka rukom ban ai nitrogen ia ki jingthung. Ka sboh dawai kaba kham kynrei eh hangne ha Meghalaya mynta imat ka dei ka urea. Ia kane ka sboh dawai lah ban ai shisien ne arsien ha u jingthung. Halor ka urea don kiwei pat ki sboh dawai kum ka ammonium sulphate ka sodium nitrate ka potassium nitrate bad ka diammonium phosphate kiba ki ju pyndonkam khnang ban ioh ia ka nitrogen. Hynrei ka sodium nitrate ka wan na shabar kane ka ri jong ngi bad ka potassium nitrate ki pyndonkam ruh na ka bynta ban shna bakhor.

Kawei pat ka rukom kaba ki nongrep ki lah ban leh ban ai nitrogen ia ki jingthung ka long da u shaba uba mih ynda la tylliat ia ki shyeing symbai, ban shim ia ka umphniang kaba mih na ki, Kum u shaba na u symbai soh-ryndia (**castor**), u shaba na u symbai shana budam, u symbai kynphad, u symbai tyrso, bad kiwei-kiwei ki jait symbai kiba pynmih umphniang. Hynrei namar ba kum une u shaba ne u kholi u long uba bit ruh ban ai ia ki masi bad ki sniang, kumta busien la ju pyndonkam na ka bynta ban aisboh tang da kito kiba kim pyndonkam na ka bynta ki jingri, kum u shaba na u symbai soh-ryndia, uba ki masi kim lah ban bam namar u lah ban don katto-katne ka umphniang julab.

### **Phosphorus bad Potassium**

Nalor ka nitrogen, ki jingthung ki donkam ruh ban ioh ia ka phosphorus bad ka potassium (potash). Ka sboh shyieng (**bone-meal**) ka long kawei na kito ki sboh dawai ba ngi lah ban ai ia ki jingthung. Ia kane ngi ioh na kaba shu tylliat ia ka shyieng ki kynja mrad baroh. Kane ka don shibun ka phosphorus bad katto-katne ka nitrogen ruh. Kawei pat ka sboh kaba don ka phosphorus ka long ka superphosphate. Nalor ka phosphorus kane ka sboh dawai ka ai ruh ia ka calcium kaba

long kawei na ki met tynrai kiba ki jingthung ki donkam. Ia ka calcium lah ruh ban ioh na ka shun. Hynrei ia ka shun la ju ai ban kham pynbha ia ka khyndew kaba skhah eh kum ka dew-ktieh. Kawei pat ka sbob dawai kaba lah ban ai na ka bynta ban ioh phosphorus ka long ka di-ammonium phosphate. Kane ym tang ba ka ai ia ka phosphorus hynrei ka ai ruh ia ka nitrogen kaba don kum ka ammonia ha ka.

Ki sbob dawai na kaba ngi lah ban ioh ia ka potassium ki long ka potassium sulphate, ka potassium chloride bad ka Muriate of Potash. U dpei ruh u long uba don shibun ka potash na kaba ngi ioh pat ia ka potassium. Namarkata u dpei jong ki dieng bad jong ki niut ruh u long uba bun bha ka potash.

Katba ka phosphorus ka pynkhlain ia ki jingthung, kumta ba u kba lane u kew ne kino-kino ki jingthung kiba iasyriem ia kine kin kham duna kaba pat (**lodge**) haba jur lyer, ne bun eh ka um, ne bun eh ka nitrogen, ka iarap ruh ia ki jingthung ban kham lait na ki jingpang bad teng-teng ka kham pynitynnad ruh ia ki. Ka potassium pat ka iarap ia ka jingbam kaba la shna ha u jingthung ban leit sha kiwei-kiwei pat ki bynta jong u jongthung hi (kum ka nuksa, ka jingbam ba u phan u shna ha ki sla, ka leit sha ki phan kiba hapoh khyndew, bad kumta ki nang-heh nang-heh), ka potassium ka iarap ruh ban kham pynmih kham bun ka chlorophyll, kata kaba pynjyrngam ia ki sla ha u jingthung, ka potassium ka iarap ruh ia ki symboh-jingbam (**grain**), bad nalor kine baroh, ka potassium ka iarap ban pynbeit ia kano-kano ka jingbym iaidbeit ha u jingthung lada bun eh ka nitrogen bad ka phosphorus. Ha kaba kut ngi dei pat ban kynmaw ba la u dpei u don shibun ka potassium, kaba thang ia ki niut ki nier lane ia ki dieng ruh ka thang duh noh ruh ia ka nitrogen kaba don ha ki bad ia ka **humus** (kynnoh hiwmos) kaba sah ha ka khyndew da ka jingpyut jong ki dieng bad ki sla dieng lane wat da ka jingpyut jong ki met-iap jong ki mrad. Kane ka humus ka long kaba pynbha ia ki khyndew rep baroh bad kaba pyniong ruh ia ki, bad kumta ngi tip ba ka khyndew kaba kham iong ka long bunsien kaba kham seisoh ruh.

**Table 1: Ka jingdon jong ka Nitrogen Phosphorus bad Potassium (Potash) ha ki sboh eit mrad bapher bapher (percent).**

<b>Sboh</b>	<b>Nitrogen</b>	<b>Phosphorus</b>	<b>Potash</b>
Eit Masi	0.3-0.4	0.1-0.2	0.1-0.3
Eit Kulai	0.4-0.5	0.3-0.4	0.3-0.4
Eit Blang	0.5-0.7	0.4-0.6	0.3-1.0
Eit Syiar	1.0-1.8	1.4-1.8	0.8-0.9
Kaibri1.0-1.6	0.8-1.2	0.2-0.6	
Umjung masi	0.9-1.2	—	0.5-1.0
Umjung kulai	1.2-1.5	—	1.3-1.5
Umjung briew	0.6-1.0	0.1-0.2	0.2-0.3
Umjung blang	1.5-1.7	—	1.8-2.0

*Source : Handbook of Agriculture, ICAR Publication.*

Ha kaba pynwai ia kane ka lynnong ngi sngew ba ka dei ia ki nongrep ban tip ruh ba don ki met tynrai kiba ki jingthung ki donkam (lane lah ban donkam) tang khyndiat eh bad kiba ym da kynrei ruh ha kano-kano ka khyndew. Ia kine ki khot ki **trace ne rare elements** (ki met tynrai kiba ym da don kam shibun). Kine ki long ka manganese, ka boron, ka zinc, ka copper (tama), ka chlorine, ka aluminium, ka silicon, ka molybdenum, bad ka calcium. Lada kine ki duna eh, ki jingthung ki lah ban ioh jingpang lane kim da san bha.

Kumta ngi la shem ba ka jingseisoh jong u jingthung ka shong eh ha ka jingdon jong ki jingbam ba u donkam u jingthung. Ngi dei ban da tip bha shaphang ka jingsboh jong ka khyndew bad dei tang lyngba ka jingphah test ia ka ba ngin lah ban sngewthuh ia ka jingsboh bad ka bor jong ka khyndew ban pynmih ia u jingthung u ba bha. Mynta ka sorkar ka la seng ia ka jaka test khyndew ha jan man la ki distrik. Ynda la dep test ia ka khyndew ki sa bthah de katno bad kumno ban ai ia ka sboh mrad lane sboh dawai ba kiwei kiwei ki sboh na ka bynta u jingthung.

## LYNNONG 7

### KI TIAR REP

Lehse kan ym long kaba da bakla eh lada ong ba lah ban ithuh ia ka jingstad u nongrep da ki tiar kiba u pyndonkam ha ka rep. Khlem da leit sha jngai eh sha ki thain jong ka pyrthei ha kaba ka jingrep ka sdang, ngi lah ban ong ba ha kine ki ri lum jong ngi ruh lah ban iohi ia ka rukom rep kaba iasyriem eh bad kato kaba ki ju leh ha ki por hyndai ba ki ri kiba pawkhmat mynta ki la iehnoh da ki hajar snem. Kawei kaba ngi iohi ha kine ki ri lum kaba iasyriem bad kito ki rukom kiba rim ha kiwei pat ki bynta jong ka pyrthei ka long ka jingpyndonkam da u dieng ban thaw thliw ha ka khyndew ha kaba yn sa tep ia u symbai. Ha kine ki ri lum jong ngi ki ju pyndonkam kham bunsien da u siej ha ka jaka u dieng. Kumjuh ruh ynda u nongrep u la sdang ban pyndonkam da u kynja mohkhiew, ha ki por ba ka jingrep ka dang sdang, ia u mohkhiew ruh la shna na u dieng, kum na u dieng sning uba long uwei na ki dieng kiba kham eh bad kham kynrei.

Ha Meghalaya, ha bun ki jaka mynta ki tiar rep kiba ngi ju iohi ki long u mohkhiew bad ka wait. Ngim lah ban ong ba ngi la iehnoh ia ka juk jong kine ki tiar ha kane ka juk mynta. Ka jingpyndonkam ia ka lyngkor ha ka jaka u mohkhiew ka la sdang shisha ha bun ki jaka. Ngi kyrmen ba ka jingpyndonkam ia ka lyngkor kan nang kham roi katba ki sngi bad ki snem ki nang ia id shaphrang.

Ha ba trei da ka lyngkor, ka bor briew kam long kaba da donkam eh. La pyndonkam da ki mrad ban ring ia ka lyngkor; bad namar ba u mrad u kham khlain bun shah ia u briew, kumta ka jingtrei da ka lyngkor ka pynlah ia u briew ban rep kham bun ban ia kaba shu trei tang da u mohkhiew.

Ha ki ri Arab bunsien ki pyndonkam da ka kada lane ka ut ban ring ia ka lyngkor. Ha ri India bad ha ki ri kiba shaphang

shathie lam mihngi ki kham pyndonkam da ki masi dab. Ha ki ri Sepngi ki kham pyndonkam da ki kulai ne ki khashor ha ki por kiba kham mynshuwa. Ka bor masi ka lah ban long kumba saw ne san shah ia ka bor briew; hynrei ka bor kulai ka long kumba hynniew shah ia ka bor briew. Kumta ka jingrep ka kham roi shibun da ka jingiarap jong ki mrad. Lada pyndonkam da ka lyngkor pat, ka donkam ba ka lyngkor ruh ka dei ban long kaba kham bha ban ia kito ki jait lyngkor kiba ki pyndonkam mynta ha kine ki thain jong ngi, bad kham bha ruh ia kata ka lyngkor ba ki pyndonkam ha kylleng ka ri India kaba ki khot ka desi plough. Ka donkam ruh ban nang pynroi ia ki masi lur ba kin long kiba khlain kum kito kiba don sha Punjab, Uttar Pradesh bad shawei-shawei. Kan donkam ruh ia ka Sorkar ban hikai ia ki samla ha ki nongkyndong ba kin nang kloi-kloi ia ka ban lur ia ki lyngkhá kba bad kiwei-kiwei ki lyngkha da ka lyngkor.

Ha ka jingiaid stet jong ka por, imat ba ki nongrep ha Meghalaya kin shem ba ka jingtnei da ka jingiarap ki masi ruh lehse kan ym biang shuh. Imat ba kan long kaba kham tad lane kham myntoi pynban ban pyntnei da ki kor kiba kham khlain ban ia ki masi lane ki kulai ruh. Ha ki lyngkha ha Meghalaya mynta ngi la iohi ia ki power-tiller kiba lah ban lur shi hectare shisngi-shisngi. Ha ki ri kiba la kham iaid shaphrang ka bor kaba ki pyndonkam mynta ban ring ia ki kor rep ka long ka tractor. Kane ka kham khlain pat bun shah ia katei ka power-tiller. Kine ki tractor ki don ka bor ban ring kaba palat ia ki 25 tylli ki kulai. Kumta da ka tractor lah ban ring ar lane saw, lane kham bun ruh ki lyngkor ha kajuh ka por. Ha badei-badei ia kine ki tractor la pyndonkam ym tang ha kaba lur, hynrei ha kaba lum ia ki niut kiba la tih da ka, bad ha kaba thung ruh ia u kew ne kiwei kiwei ki symbai jingthung, da ki **seed-drill** (baroh ha kajuh ka por).

U mohkhiew uba ngi pyndonkam ha ri Khasi, u long u tiar rep uba lehse ngim lah shuh ban kham pynbha ban ia kaba u long mynta, hynrei ka lyngkor ka long ka tiar rep kaba dang donkam shibun ban pynjanai khnang ba kan trei janai ha ki



jaka kiba pher-ba-pher ha kane ka ri. Kumjuh ruh kiwei-kiwei ki tiar rep kiba ngi pyndonkam mynta ha kaba pynmadan ia ki lyngkha kba, ne lyngkha phan ynda la lah lur ia ki da ka lyngkor ki dang donkam shibun ka jingpynjanai ia ki. Kine ki tiar ruh ki iapher kat kum ka jingheh ki masi lur lane kat kum ki kor ba ngi pyndonkam kum ka power-tiller ne ka tractor.

Ki tiar rep kiba ngi lah ban pyndonkam bad ki masi ki long ki **harrow**, ki **cultivator**, ki **seed-drill**, bad kiwei. Ki harrow ki long ki tiar kiba lum ia u ñiut bad kham pynmadan ia ka khyndew shuwa ban thung ia uno-uno u jingthung. Kine ruh ki long ar lai rukom. Ka **spike-tooth harrow** ka long ka frame nar ha kaba la pynskhem ia ki nar kiba kum ki shniah; bad haba ring ia kane da ki masi ka lum ne pynlang ia ki ñiut bad ka kham pynmadan ia ka khyndew kumba ngi la ong haneng. Kawei pat kaba ki nongrep ki ju kham pyndonkam ka long ka **spring-tooth harrow**. Kane ka iasyriem bad ka spike-tooth tang ba ha ka jaka jong ki spikes la pynskhem da ki spring. Nalor kine ar ka don sa kato kaba ki khot ka **disc harrow**. Kane ka harrow ka don da ki disc nar kiba long ha ka dur jong ka pliang kaba nep na ki rymmian jong ki; bad haba ring ia kane ka harrow, ki disc ki tyllun bad ki ot ia ki lyngkhot khyndew, ia ki ñiut ki ñier bad pynngam ia ki shapoh khyndew bad ka kham pynmadan ruh ia ka khyndew shuwa ban thung ia ki symbai.

Ki cultivator pat ki long kito ki tiar rep kiba ki pyndonkam ban kynroi ia ka khyndew bad ban kyntiew khyndew kum ia u phan u riewhadem, ki kubi, ki sohsaw bad kiwei-kiwei ki jhur bad jait jingthung kiba ym da heh eh haba thung ia ki ha u lain. Ki cultivator ruh ki don bun jait: don kito kiba lah ban shu khyñiat da u briew; don pat kito kiba kham heh kiba ring da ki masi, lane kiba kham heh shuh-shuh kiba ring da ka tractor.

Nalor kitei ki tiar rep, don ruh bun jait kiba ki nongrep kiba dang kham sah dien ki pyndonkam, kum ka jingkieng kaba ki pyndonkam ha kaba thung kba ha kaba pynphret ia ki lyngkhot khyndew (**clode**) bad kham pynjih bad pynmadan ia ka khyndew; lane kum ka lyntang lane u dieng (**beam**) uba ki pyndonkam ban kham pynskhem (**compact**) ia ka khyndew.

Ka jingrep ha Meghalaya imat ka donkam eh ban ioh ki tiar rep ki ban iarap ha kaba ot kba bad khamtam ha kaba pyniakhlad ia u jingtang kba na u kba (**thresher**). Ka jingdonkam ia ka thresher kaba lah ban pyndonkam da u nongrep ha ki nongkyndong imat ka long kaba donkam eh ba u nongrep u dei ban ioh noh kham kloi.

Ka jingroi ha kaba pyndonkam ia ki tiar rep ki ban iarap ia u nongrep ban pynjem bad iarap ia ka kam jong u kan pyni ia ka jingroi jong ngi ha Meghalaya ha ka jingrep.

**KA JINGTUID KA KHYNDEW**

Ka jingtuid ka khyndew rep sha ki wah rit bad ki wah bah ka long kawei na kiei-kiei kaba ki nongrep ha Meghalaya ki dei ban sngewthuh. Ha ka jingiabeh ban pynmih kham bun ka bam ban ia kaba ngi la ju pynmih mynshuwa, ka khyndew rep ka la nang phet noh shathie sha ka ri thor bad wat shaduh ki duriaw bah. Ia kane ka jingtuid ka khyndew bun na ki nongrep kim lah ban iohi ha ka shisnem bad ar snem, hynrei lada ngi lah ban thew bad da bishar bniah ngi lah hi ban iohi ba kane ka jingtuid ka khyndew ka la nang pynlong ia kane ka jylla jong ngi kaba nang kham duna ha ka jingseisoh. Ki nongrep kiba mynno-myno ki ju rep ha ki jaka kiba kham sha ki lum jong ngi, mynta ki la nang hiar sha ri Bhoi namar ki lum Khasi ki la sdang ban synlen. Ki khlaw bad wat ki jaka ha kiba ju don mynno-mynno da ki bniap lane da ki phlang kiba jrong ki la nang duna-duna. Ka daw ka long ba ka khyndew rep jong ngi ha Meghalaya ka la tuid shathie sha ki pynthor jong ka Shilot ne jong ka them bad ki pynthor ka Brahmaputra ha Assam. Kumta ka ri dkhar ka la nang seisoh hynrei ki ri lum jong ngi ki la nang kham duk kham duk. Ki geologist ki iathuh ia ngi ba ka Bangladesh baroh kawei ka la ju long ka duriaw; kumjuh ruh ka Them Assam (Assam Valley). Hynrei ia kine ki bynta jong ka duriaw bah la pyndap da ka khyndew kaba la tuid na ki lum kiba baroh sawdong jong ki. Ka khyndew na ki lum Garo, Khasi bad Jaintia (kata, na Meghalaya), na ki lum Cachar, ki lum Naga, Manipur, Mizoram bad Tripura ha ki hajar ki lak bad ki millian snem kiba la leit noh ki la pyndap ia ki pynthor jong ka Shilot bad ia ki pynthor kiba shaduh Dhaka bad khadduh khadwai ki la pynpoi ia kata ka khyndew shaduh ka duriaw Bay of Bengal. Kumjuh ruh ia ka them Brahmaputra baroh kawei kaba la ju long shibynta na kane ka duriaw la pyndap da ka khyndew kaba tuid na ki lum kiba ki khot mynta

ki Eastern Himalayas bad kiba la kit da ki wah kiba tuid lyngba  
 ka Bhutan, ka Arunachal Pradesh, ki lum Naga bad na  
 Meghalaya ruh. Ki geologist ki iathuh ia ngi ba ki lum ha  
 Nagaland mynno-mynno ki jrong haduh kumba 20,000 phut  
 (kumba 6000 metres), hynrei u lum Japho, u lum uba jrong  
 tam mynta ha Nagaland u la long mynta uba kham duna ia ka  
 10,000 phut ka jingjrong nador ka sla duriaw. Hynrei ka jingtuid  
 ka khydew ha kine ki thain mynta ka la nang kham stet shuh-  
 shuh ban ia kaba ka ju long mynno-mynno ha ki hajar bad ki  
 lak ne ki millian snem kiba mynshuwa. Ka daw ka long ba u  
 briew u la nang bun bad ka jingpyndonkam ia ka khyndew  
 ruh ka la nang kham khraw ha kaba ngi wad ia ka myntoi. Ia  
 kane ka jingtuid ka khyndew ngi lah ban iohi shai na ka jingsaw  
 jong ki wah kiba tuid ha kine ki ri lum jong ngi ha ka por slap.  
 Ki riewstad ki iathuh ia ngi ba ka Ganges bad ka Brahmaputra  
 ki kit kumba 378,000,000 ton ka khyndew man la ka snem.  
 Kumba 19 milian ton ka khyndew ka tuid man la u snem na  
 ka daw ka jingrep shyrti ha kine ki thain shatei lam mihngi . Ki  
 wah ri Khasi, Jaintia bad Garo ruh ki iarap ha kaba kit ia kane  
 ka khyndew sha ki ri thor bad ka duriaw Bay of Bengal La  
 shem ba kumba 21 na ka shispah ka jaka hapoh ka dew bah  
 (geographical area) jong ka Meghalaya ki la kylla long ki jaka  
 bym lah rep shuh namar ka jingtuid ka khyndew. Kine ki jaka  
 ki long kito ki jaka kiba la shu eh noh hadien ka jingrep shyrti,  
 ki lum syllen bad kito ki ba la sah sa tang ki maw. Shuwa ban  
 wan ki phareng sha kine ki rilum jongngi ngim ju tip kata ka  
 rep phan. Ka rep riewhadem ruh imat ka sdang hi ynda wan  
 ki phareng. Hynrei naduh ba la wan ki phareng, ka rep phan,  
 ka rep riewhadem bad kiwei kiwei ki jingthung ka la iaid stet  
 katta-katta. Ka jingrep ia kine ar ki jait jingthung lei-lei ka la  
 pynmih shibun ka jingtuid ka khyndew na ki lum jong ngi.  
 Kane ka jingtuid ka khyndew ka kham stet ha ki thain jong ki  
 lum Himalaya; bad ngi dei ban kynmaw ba ka Nagaland bad  
 ka Mizoram ha ki thain mihngi jong kane ka ri India jong ngi ki  
 long ha ki bynta kiba shaphang mihngi eh jong ki lum  
 Himalaya. La iathuh ia ngi da ka Forest and Soil Conservation  
 Ministry ha Nepal kaba long ha ki pdeng jong ki lum Himalaya,

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ba ha ki 35 snem ba la lah palat ia ka shabawa na ki khlaw jong  
ka Nepal ki la duh noh. Ngim artatien ba ki Nepali ki la pher  
sha kiba bun ki bynta jong kane ka konamar ki la duh non ta  
kine ki khlaw kiba ju kyrshan ia ka rep bad ka jingim jong ki  
baroh kawei.

Kawei na ki rukom kiba pher ba pher kiba ngi lah ban leh  
ban pynduna ia kane ka jingtuid ka khyndew ka long da kaba  
shna ki **terrace** syriem kum ki ben (bench) ha ki ranab lum.  
Hynrei kine ki terrace kim long ha ki jaka kiba sharing eh, ka  
jinglut ka long kaba jur ha ka ban sumar ia ki terrace ha ki jaka  
kiba kum kine. Ka shitom ruh ban pyndonkam da ki masi ha  
kaba lur ne kynroi ia ka khyndew ban pynduh ia ki niut. Kine  
ki terrace ki dei ban long kiba kham iar khamtam lada dei ban  
pyndonkam da ki kor kiba ngi pyntrei mynta ha ka rep kum ki  
power-tiller bad kiwei-kiwei. Ha kaba shna ia kine ki terrace  
ngi dei ban shna pyngkiang ia ka sharing kumta ba ka um slap  
kan kham neh ha ki. Haba tih ia ki terrace ngi dei ban kynmaw  
ba ka um slap kan ym tuid sha kadiang lane sha kamon, lane  
arsut jong ka sharing hi. Ka bha ba ka terrace kan kham thiah  
shaphang u lum ym arsut jong u lum. Kane kan kham bat ia ka  
um slap ka ban hap ha ka. Kine ki terrace ki long kat kum ka  
**contour**, kata, ki bud pyngkiang pynkiang ia ka. Namar ba ka  
Sorkar mynta ka tip ba kine ki terrace ki pynneh ia ka jingsboh  
ka khyndew kumta ki da bei peisa ne ai subsidy ia kito ki  
nongrep kiba la kloï ban shna ia ki.

Ia ki jaka kiba sharing eh te ym dei ban terrace. Ka bha ia  
kiba kum kita ban iehnoh khlaw lane ban thung da ki dieng  
khlaw kiba ngi lah ban pyndonkam lane da ki diengsoh. Ia ki  
khlieh jong ki lum te ka dei hi ban iehnoh khlaw. Ki khlaw ki  
pynsboh ia ka khyndew. Ngì ki nongrep ngi dei ban tip ba ka  
jingrep khlem ki khlaw ka long kaba duna ka jingmih. Kawei  
na ki daw balei ngi donkam mynta ban wad sa ki sboh dawai  
bad kiwei-kiwei ka long namar ba ki khlaw ki la sdang ban  
nang duh noh.

Kh nang ba ka khyndew kan kham duna ka jingtuid, ki  
nongrep ki la dei ban pyndonkam shibun ki lad ruh kumno

ban rep lane ban thung jingthung. Kawei na kita ki rukom rep ka long kaba ki ong **contour farming**, kata ka rukom rep ha kaba ki nur ne ki lain na kiba ki bet ia u symbai ki bud ia ka contour, kata, ka lain ka bym hiar ne kiew hynrei kaba iaid kat kum ka **elevation** jong kata ka lain ne ka nur ha ka lyngkha. Kawei pat ka rukom kaba ngi lah ban kdew hangne ka long kaba ngi khot ka **strip cropping**. Kane ka long ka rukom jingrep ha kaba kawei ka lyngkha ha ki ranab ki bym da sharing eh la thung da uwei u jingthung ha kawei ka elevation bad ha kawei pat kaba harum lane haneng la thung da uwei pat u jingthung, bad kumta ter-ter. Ka jingthmu jong kane ka long ba haba thung da u jingthung ha ka lyngkha kaba haneng, da u jingthung lane u riewhadem uba dei ban da kynroi ia ka khyndew, la thung pat harum da uwei pat u jingthung uba ym da donkam eh ban da kynroi ia ka khyndew. U rymbai ktung lane u phan karo ki long kiba kum kine ki jait jingthung. Kine kin iarap ban bat ia ka khyndew kaba lah ban tuid na ki lyngkha phan ne lyngkha riewhadem.

Ka rukom rep kaba ha ri Khasi ki tip kum ka rep shyrti ka long kawei pat ka daw kaba kongsan kaba la pynrong noh ia ka khyndew na ki kper bad ki lyngkha jong ngi ha kine ki ri lum. Kane ka jingrep shyrti ka long kaba ki ju leh ha ki bun ki bynta ha ka pyrthei ha kaba ki briew ki dang sah dum bad haba ka khlaw ka btap ruh ka dang kynrei. Hynrei mynta ba u khun bynriew u la nang jyllei ha ki jaka baroh, kam long shuh kaba dei bad kaba stad ban rep shyrti. Kito kiba rep shyrti ki pom ia ka khlaw ha ki ranab lum ha ka por tlang bad tang shu sdang ka pyrem haba kito ki dieng ki siej kiba la pynkyllon ha ki lyngkha ki la rkhiang, la thang ia ki haduh ba kin da kylla dpei, hadien kata la puh ia ki shuwa ban thung u kba lum ne thung phan ne kino-kino kiwei pat ki jingthung kiba la jied ban thung hangta. Ha ki por kiba mynshuwa katba dang bun ki khlaw ki btab bad haba u briew u dang duna, ynda la thung da ki jingthung ha kita ki lyngkha kumba lai snem la iehnoh ia kata ka jaka namar ka sboh ka la nang duna bad kam long shuh ban thung kino-kino ki jingthung. Uto uba rep hangto u la dei ban wad da kawei pat ka jaka kaba thymmai bad ban

h biang kumta kumba u la leh lai snem mynshuwa. la kane  
 a rukom kynriah jaka rep ki khot ha ka ktien phareng **shifting**  
**cultivation**. Ha kane ka ri India jong ngi la tip ia ka lane la  
 hot ia ka ka rep **jhum**. Katba ka khlaw ka dang bun bad ki  
 riw ruh ki dang duna la lah ban leit phai pat sha kajuh ka  
 jaka ba la rep mynshuwa hadien san, hynriew ne kham bun  
 nem ruh. Hapdeng kine ki snem ka khlaw kaba dang mih  
 hymmai ka la lah ban kham pynsboh ia ka khyndew haduh  
 ia ka la long kaba bit pat ban rep. La kumta ruh ka khyndew  
 ia kane ka jingrep shyrti ka la nang tuid noh kham sharum  
 ane sha ki wah kiba kit ia ka sha ki pynthor bad shaduh ki  
 luriaw ruh. Ki khlaw ruh ki la nang rit nang rit bad khadduh  
 hadwai ki la duh noh haduh ba ym lah shuh ban rep ha kita  
 i jaka kiba la long ki jaka rep mynshuwa. Ha ka jingtuid ka  
 hyndew ruh la sah sa tang ki maw bad ki mawsiang; bad namar  
 a kine ki long kiba shit klo i ha ka sngi kumta ka jingshit  
 ngkhriat jong ka jaka ruh ka la nang kylla : ka kham shit  
 ynsngi bad kham khriat mynmieid. Kum ki briew kiba stad,  
 amar kata, ngi dei ban iehnoh ia kane ka rukom rep bad ban  
 aw ki lad ban nym phet shuh nawei shawei bad ban shu rep  
 eit tang ha kawei ka jaka da kaba pyndonkam ia ki buit rep  
**technology**) kiba kham bha.

## LYNNONG - 9

### U PHAN

U phan (*Solonum tubersum*) u long u jingthung uba kham kongsan eh ha ri Khasi-Jaintia namar kata ngin sdang shuwa da une u jingthung.

U phan, kumba nga la ong ha ki lynnong kiba mynshuwa, u long u jingthung u ba mih nyngkong ha South America. Imat une u jingthung u la mih nyngkong nyngshap eh ha ar tylli ki jaka ha katei ka ri, kawei ka long ha ki jaka lum jong ka ri Peru bad Bolivia bad kawei pat ka long ha rud duriaw jong ka ri Chile. Nangta ki lawan sha ka ri Europe, shen hadien ba la shem ia ka ri America da u Christopher Columbus. Nangta pat u sa phriang kylleng ka pyrthei. Shen hadien ba la wallam ia u phan sha India, u Warren Hastings, u Lat Rangbah (**Viceroy**) jong ka ri India ha ka por shynshar phareng, u la ioh katto katne u symbai phan bad u la phah thung ha Sohra. Kata ka long la sien ka nyngkong eh ba la thung phan ha ri Khasi-Jaintia. Mynta ka jingthung phan ha kane ka ri jongngi ka la roi haduh katta katta ba ka long kaba eh ia u Khasi-Pnar ban pyrkhath ba laispah snem mynshuwa um juh tip ia une u jingthung. Ka jingroi jongu ha ka pyrthei ruh ka long kaba phylla namar u long mynta uwei na ki lai tylli ki jaid jingbam ba kongsan tam, hynrei namar ba don kham bun ka um ha u phan ban ia u kew lane u khaw, kumta u kew bad u khaw ki long, ha ka jingshisha, ki ba kham donkam ban ia u phan. Ka pyrthei baroh kawei ka pynmih kumba 270 millian ton u phan, 595.5 millian ton u kew bad 529 millian ton u khaw. Ki san tylli ki ri ki ba pynmih shibun eh u phan ki long kine : 1. Russia, 2. China, 3. Poland, 4. India bad 5. U.S.A. Ka India ka wan ba saw ha ka jingkhlain ban pynmih phan.

U phan u long u jingthung uba long khambha ha ki jaka khriat. Dei na katta ka daw ba ka Russia kaba long ka ri kaba khriat ka wan ba nyngkong ha ka jingkhlain ban pynmih ia u



phan ban ia ka India kaba long ka ri kaba shit. Dei ruh na kane ka daw ba ha ri India ki juh rep phan ha ka por tlang sha ki thain ri thor bad ha ka por lyuir ha ki thain ri lum. Tangba ki jaka ba shit kum ka Gujarat ka pynmih 24.55 ton shi hektar, ka West Bengal ka pynmih 21.97 ton shi hektar, katba Meghalaya pat kaba long ka jaka khriat ka pynmih tang kumba 8.53 ton shi hektar. Hoiod don kiwei pat ki daw nalor ka jingkhriat kiba pynlong ia u phan ba un met bha ha kawei ka jaka bad met sniew ha kawei pat. Kane ka shong ha ka jingstad jong ki nongrep, ka jinglong ka khyndew bad kiwei kiwei pat ki daw kum u symbai bad ki buit rep ba kham bha.

Ki jaid khyndew kiba bha eh ban rep phan ki long kito kiba nga la khot ha ki lynnong ba mynshuwa ki **loam**, kata ki khyndew kiba shiteng shyiap bad shiteng dewbyrtha (**clay**). Ha ki khyndew kiba tang ka dewbyrtha u phan un ym lah ban kysiep, hynrei ha ki khyndew shyiap ruh um da long bha namar kine ki jait khyndew ki duna eh ka jingbam ba donkam na ka bynta ki jingthung baroh. Ha ka ri Khasi-Jaintia, ka ri kaba bun bha u slap, ka khyndew ruh ka dei ban long ka ba ym bat eh ia ka um namar ba lada bun eh ka um ha ka khyndew u phan u lah ban pyut. Ki nongrep ha ri Khasi-Jaintia lehse kin sngewlyngngoh ban tip ba ha Allahabad ki ju ai um (**irrigate**) haduh kumba hynriew sien ia u phan shi aiom; katta la jan man ka ar taiew. Ki leh ia kane namar ka jaka ka rkhiang eh bad kam ju ioh slap kumba ioh ha ri Khasi-Jaintia.

Ka rukom thung phan ha ri Khasi-Jaintia ruh ka iapher shibun na ka rukom thung phan ha ri dkhar ne ri sepngi. Sha ri dkhar bad ha ri sepngi ruh ki ju thung ha u lain ne ha ki lynter-lynter (**row**) kiba jrong bha na ba sdang ha ba kut ka lyngkha. Ki buh ia u phan symbai ha madan bad ki sa kynton da ka khyndew na baroh ar liang. Ha ri Dkhar ki kynton ia kane ka khyndew da ka lyngkor, kumta ka don ka nur ban ai um hapdeng ar tylli ki lynter jong u phan. Ha ri Khasi-Jaintia, bad ha ri lum jong ka ri India baroh kawei, ki ju thung phan da ki kynton kiba la pynmadan shuwa (**raised beds**), namar nga ngeit ba bun eh u slap bad kumta ka pynjulor eh ka lapiong ha

ki rilum ban ia ha ki ri thor. Don kawei ka jingduna ha ka rukom rep phan ha ki ri lum mynta, bad kata ka long kato kaba nga la pyni ha ka lynnong kaba mynshuwa, ba ka khyndew kaba na jrong, kaba long kaba bha tam na ka bynta ki jingthung baroh, ka tuid lut sha ki ri thor. Kane ka jingleh jong ki nongrep ha ri Khasi-Jaintia ha kine ki shispah snem ba la leit ka la pynlong ia ka khyndew jongngi ban ym seisoh bha shuh namar la sah sa tang ki maw.

U phan u long u jingthung u ba donkam bha ia ka sboh. Kumta kumba nga la pyni ha ka lynnong kaba lai, ngi dei ban ai sboh ia ka lyngkha phan, la da ka sboh eit masi ne da kiwei pat ki sboh kiba nga la pyni ha kajuh hi ka lynnong.

Shuwa ban thung phan dei ban da jied bha ia u symbai. Uno uno u symbai uba don ka dak pyut dei ban kyntait noh namar ba u lah ban pynmih ia ka jingpang iapiong lane pang syrwiang (**ring disease**). Kaba donkam ha ka jingshisha ka long ba u nongrep u dei ban jied na ka bynta u phan symbai da u phan u bym pyni dak jingpang ei ei ha lyngkha, namar ba ka jingpang pynraid (**curly dwarf**) ruh ka long kaba juh don ha ki ri baroh kiba thung phan. U phan symbai um dei ban long uba rit eh ne heh eh. U symbai ksain u lah ban long uba don kitei ki jingpang, hynrei lada thung da u symbai uba heh eh ruh lah ban don ka jingduh ia u nongrep. U symbai phan u lah ban long kumba shi inshi ne shi inshi shiteng ka jingheh. Ha ri dkhar, ia u phan uba na rilum bad u ba heh palat ki juh ot ar ne lai liang shuwa ban thung ia u. Haba ot kumne ki ju iehnoh ar ne lai tylli ki khmat ha u symbai. Nga artatien ba kane ka lah ban myntoi ia u nongrep ha ri Khasi-Jaintia ban leh, namar ka lah ban pynpyut ia u symbai. Haba dei ba dei ki nongrep, shuwa ban thung ia u phan, ki da pynspeh ia u. Haba pynspeh ne pynmih khmat ia u phan symbai ki ju buh ia u ha ka shang ka bym da jylliew eh bad ki sa tap ia kane ka shang da u phlang u ba sngem. Nangta ki sa buh ia kane ka shang habar ha ka por ba mih sngi. Da kaba leh kumne lah ban ithuh ia u symbai uba khlain bha bad ka pynkloi ruh ia ka jingmih u phan ynda la tap ia u da ka khyndew. Ha ka shi hektar donkam kumba 2000-2500 kilo u phan symbai.

Ynda u phan u la mih bad u la jrong kumba 6 inshi ei ei, ki ju kynroi ia ka khyndew bad kynton ia ka (**earthing up**) sharud u phan. Hadien kumba lai taiew pat ki kara sa shisien khnang ba u phan un ioh kyan bha. Kaba kara ka pynduh ruh ia ki niut ki nier kiba lah ban iaknieh ia ka jingbam jong u phan na ka khyndew. Ha ri Dkhar ki ju kara ia u phan da ka kor kaba ki khot ka **grubber** ne ka **cultivator** ba ki khot ha ka ktien phareng. Hadien jong kane ka cultivator ki ju pynsnoh da ka lyngkor kaba kynton khyndew (**ridging plough**) kumta ka jingkyntoi bad jingkynton khyndew ka long ka ba shisien leh. Ha ki rilum bad ha ki katto katne pat ki jaka ha ri India ki pyndonkam da ki mohkhiew ban kara tangba kane ka long ka ba shim por shibun eh.

U phan u don katto katne ki jingpang kiba u shait kem eh. Kaba nyngkong bad kaba ki ju tip bha ha kylleng ka pyrthei ka dei ka jingpang iapiong (**potato blight**). Kane ka jingpang ka kham roi haba ka bneng ka syiad bad sngem. Kane ka jingpang ka wan roi na kita ki mangkariang kiba rit (**fungus**) kiba ngim lah ban iohi da la ki khmat hynrei tang da ka it tyndong (**microscope**). Kine ki khniang ki bam ia kiwei pat ki jingthung bad ki sah hapoh jong u. Namar katta kane ka jingpang ka lah ban don hapoh u phan symbai lane ha ka khyndew. Kumta haba kane ka jingpang ka la mih ha kano kano ka lyngkha ka bha ban ym thung phan ha kata ka jaka kumba lai ne saw snem haduh ban da duh kata ka jingpang. Khnang ban iada ia kane ka jingpang ki ju synreit da ka dawai kaba ki khot ka **bordeaux** (kynnoh bordo) **mixture**. Ia kane ka dawai la shna da kaba khleh ar kilo u tutia, ar kilo ka shun im bad arspah arphew san litar ka um. Nyngkong pynum ia u tutia ha ka pipa da kaba song ia u ha kano kano ka jain rew. Ia ka shun im pat ki khleh ha kawei pat ka pipa da kaba theh um suki suki katba ka nang thnam. Hadien nangta ki sa theh lut ia ka um kaba sah baroh. Hadien kane ki sa khleh ia katei ka um tutia bad ka um shun ha kawei pat ka pipa. Ia kane ka jingkhleh ki sa buh pat ha ka kor kynshait um kaba ki khot ka **sprayer**, kaba ngi lah ban thied na ki dukan ba die tiar rep. Nalor kane ka dawai, la don ruh sa kiwei ki dawai iapiong bad kita ki long ki **copper**

**fungicide, mancozeb** lane ka **metalaxyl**. Kine ki long ki kyrte ng paka jong ki dawai, hynrei haba ki kompani ki die ia kine ki dawai ki ju sin kyrte ng da kiwei pat. Kine ki long ki dawai kiba u nongrep u kham suk ban pyndonkam namar ki long ki dawai ki ba la khleh lypa da ka kompani.

Kawei pat ka jingpang phan kaba ju kham jia ha kane ka ri jongngi ka long katei ka jingpang kaba nga khot haneng ka jingpang syngwiang (ring disease). Kane ka jingpang ka long na kiwei pat ki jait jingthung kiba rit haduh katta katta bad ki ba iasyriem ia kitei kiba pynlong ia katei ka jingpang kaba nyngkong. Ia kine ki jaid mangkariang barit ki khot ki **bacteria**. Kane ka jingpang ka shu pyniap tlor rynieng rynieng ia u phan, bad dei na katta ka daw ki phareng ki ju khot ka **bacterial wilt** ia kane ka jingpang. Lada ot ia u phan uba ioh ia kane ka jingpang lah ban iohi ia ka bynta kaba iong baroh sawdong u phan kaba long kum ka jylli. Ym lah ban leh ei ei ia kane ka jingpang hynrei tang ban ym thung ia u phan symbai u ba wan na ka lyngkha kaba don kum kane ka jingpang. Ha ka lyngkha kaba don kum katta ka jingpang ym dei ruh ban thung phan haduh kumba lai ne saw snem. Wat ia ka jingthung kiba iadei kur bad u phan ruh ym dei ban thung ha katei ka lyngkha, katta kum u sohsaw, u sohbaingon iong, u dumasla, u soh mynken bad kiwei kiwei.

Kawei pat ka jingpang phan kaba shait jia ha kylleng ka pyrt hei ka long kato kaba nga la khot haneng ka jingpang pynraid. Kane ka jingpang ka pynlong ia ki sla phan ban stem bad jyrngam pateng-pateng. Dei na kata ka daw ba ki phareng ki ju khot ia kane ka jingpang ka **mosaic disease**. Ki jingthung kiba ioh ia kane ka jingpang ki raid, kata ki sla ki kham rit, ki jintang phan ruh kim da jrong bad ki phan ruh ki da rit bha. Kane ka jingpang pat ka long na kita kiei kiei ki kynja met kiba ki khot ha ka ktien phareng ki **virus**. Ki riewstad kim pat da sngewthuh bha haduh mynta ruh shaphang kine ki virus. Ki tip ba ki long kiba rit katta katta bad ba lah ban iohi tang da ki it tyndong electric (**electron microscope**). Ki dei ki kynja met kiba long bih ne ki kynja jingthaw kiba pynlong ia ki katto

katne ki jingpang ha ki jingthung bad ha u briew ruh kum ka jingpang niangthylliew. Ki riewstad ki tip ba donkam kita ki kynja met, namar lah ban pynkem pang da kine ki met lada kyrshut ia u jingthung uba pang bad uwei pat u jingthung uba koit. Ym don dawai ba lah ban pyndonkam na ka bynta kane ka jingpang, hynrei katba lah, dei ban jied ha ka lyngkha (**rouge**) ia ki phan kiba pang ~~ka~~ kumtei bad ban bret noh ia ki lane thang, khnang ba kin ym pynroi ia kane ka jingpang. Ka daw kaba kongsan balei ba uno uno u jait phan ynda bun snem u nang sniew nang sniew ka long lehse ba kane ka jingpang ka nang roi da kaba ki nongrep bunsien ki jied ia ki phan rit ban buh symbai. Kane ka jingpang ruh ka kham jur ha ka jaka syaid, kumta ka long kaba bha bunsien ban thied symbai phan na ki jaka kiba kham khriat. Dei na kata ka daw ba u phan na Bilat u lah ban khambha ia u phan na ri Khasi-Jaintia hynrei hadien katto katne snem u lah ban nang troin.

Nalor kitei ki jingpang don pat katto katne ki khniang kiba bam ia u phan Kaba kham kongsan na kine ka long ka niang pulit kaba ki khot da ka ktien saian ***Epicluta albouittata*** Ka long ka jait khniang kaba, lada ka dem ha ka met u briew, ka pynpdung ia kata ka jaka. Ia kane ka khniang ha ka ktien phareng ki ju ong ka **blister beetle**. Kane ka khniang ka bam ia ka sla phan haba dei ba dei haduh ban da dkhaw ka lyngkha. Lah ban pynduna ia kine ki khniang da kaba ber da u phngit (**dust**) uba shna na u **pyrethrum**, u jingthung uba dang pyrshang ban thung mynta ha ri Khasi-Jaintia.

U phan u shim por kumba saw bnai ban met. Ha ri Khasi-Jaintia u phan uba ki thung ha u bnai February-March ki ju khlaw ha u bnai July-August. Uto uba ki thung pat ha u August-September ki khlaw ha u bnai December. Sha ri thor ki ju thung phan ha u bnai October-November bad ki khlaw pat ha u bnai January-February. Kaba bha eh ka long ban khlaw ia u phan ynda la kut ka aiom, namar lada khlaw kyrkieh, u phan u lah ban pyut kloi lada buh ia u, bad ym lah ban shalan jngai ia u. Ka daw jong kane ka jing pyut kloi ka long namar ba ka snep phan kam pat eh bha. Ynda u jyntang bad ki sla baroh ki la tlör bad iap, kata ka por ban khlaw ia u ka la poi.

Ynda la khlaw ia u phan, ia kito kiba pyut lane kiba mong kumno kumno dei ban pyniakhlad noh na u phan paidbah, lymda kumta kito ki phan kiba ia kynduh bad kine kiba pyut ki lah ban pyut lang. Ka bha ban pyniakhlad ia ki phan kat kum ka jingheh jong ki. Lada shu iabuh lang, kan pynhiar dor ia u phan baroh, hynrei lada buh jied ia ki, kata ka dor kan kham bha shibun. Khamtam lada khangnongrep ki lah ban ialang kumba ki ju leh sha kiwei-kiwei ki ri ban pynlong ka jingialang die phan (**Potato Growers' Association**), kane ka jingjied ia u phan (**grading**) kan long kaba jem bad kaba myntoi shibun. Ka Sorkar mynta ka iarap ia u nongrep ban jied (**grade**) ha kane ka rukom, kumta u nongrep u ioh jingmyntoi shibun.

Ynda la lah rat ia u phan, ka donkam bunsien ban buh slem ia u ha iing khnang ban tyngkai symbai lane ban ym die duh ia u ha ka por ba dang tad u phan. Ha ki ri kiba khriat, u phan u ju neh kham slem khlem da pyut, hynrei ha ki jaka syaid, ka jingpyut phan ka long kaba jur katta-katta ba ka long ka bym lah ban buh ia u phan khlem jur ka jingduh. Kawei na ki daw jong kane ka jingpyut phan ka long kito ki bacteria kaba nga la thoh ha ki sla kiba mynshwa. Ka lah ruh ban long na ka bynta kawei ka niang thapbalong ynda ki mih na ki pylleng ki long kum ki niangniuh (**caterpillar**), bad ki khlong thliw (**tunnel**) hapoh u phan. Khnang ban iada na kane ka jingpyut phan namarkata, ki nongrep ha kylleng ka pyrtnei ki iawad buit kumno ban buh ia u phan ha iing lane ha ki kudam khlem da pynsniew ia u. Kawei ka rukom kaba ki lah ban leh ha ri Khasi-Jaintia ka long ban buh ia u shyiap uba rkhiang. Une u shyiap ha ki rynsan um dei ban jylliew palat ia ka shiphew inshi. Nangta pat man la ka ar taiew dei ban jied bad ban pynkynriah noh ia kito ki phan kiba pyut. Kane ka iing kaba buh phan ruh ka dei ban long kaba rkhiang bha bad kaba don ka jingkhangiit, namar lada buh ia u phan ha ka jingdum kham slem, u lah ban speh. Kane kan iada shibun na katei ka niang thapbalong kaba ki khot ha ka kyrteng saian ka **Phthorimaea operculella**. Ka iada ruh na ki katto katne ki jingpang bacteria. Hynrei kaba bha eh ban iada ia u phan na kane ka jingpang kaba dei na ki bacteria ka long ban buh ia ki ha ka kamra kaba

khriat namar ba kine ki bacteria kim lah ban roi sted ha ka jingkhriat bad kumta u phan u lah ban neh slem.

Nga ngeit ba kaba bha eh ban buh phan ha ka ri Khasi-Jaintia ka long ban buh ia u phan ha ka thliew kaba la tih jylliew kumba ar phut shiteng ne lai phut, bad kaba iar ruh kumba lai phut. Ka jingjrong jong ka thliew kan long kat kum ka jingbun jong u phan. Nangta pat siang da ki sla kiba rkhiang ha trai jong ka thliew bad siang ruh sah ki rud ki rud jong ka thliew kumta ba u phan un ym ia kynduh bad ka khyndew. Ia u phan uba rkhiang bha bad uba tlem ki buh ha kane thliew, haduh kumba hynriew inshi na ka shyntur jong ka thliew. Nangta ia ka thliew ki sa set da kaba buh ki dieng met jong ki jingthung kiba syriem ia ki dieng met riewhadem (**dried maize stalks**) lane da u phlang. Khnang ba u phan ha kine ki thliew un ioh lyer bha kata ba un ym iap op, ki ju buh da ki skong kiba ki la pynpei thliew lyngba bad pynieng ia ki ha kine ki thliew kum ki atoskhana. Kine ki skong ki dei ruh ban don thliew na sharud kumta ba ka lyer kaba don ha kane ka thliew ka lah ban mih bad ka lyer kaba na shabar kan ioh rung hapoh. Lada katei ka niang thapbalong kaba nga la batai haneng kaba ki khot ha ka ktien saian *Phthorimaea operculella* ka kynrei, ka donkam ban tap ia kine ki thliew kiba paw shabar da ki jar nar khnang ba kane ka khniang kan ym ioh ban rung bad ban leit kha pylleng. Lada kane ka thliew ka sngem eh, ki phan ki lah ban speh. Donkam namarkata, ban iai jngoh ia kine ki phan ioh ki pyut na kano kano ka daw. Ha ki jaka kiba bun bha u slap, kum ha ri Khasi-Jaintia kaba bha ka long ban shna ka kynja iing-dara ban da ia kane ka thliew na u slap.

Ha ki ri sepngi ruh ki ju buh phan ha ki thliew, syriem ia katei ka rukom kaba nga la batai haneng. Hynrei ha kine ki por mynta, ia u phan ki ju buh ha ki iing kiba ki la pynkhriat bha da u thah. Lada ka jingshit jong kata ka kamra ka long kumba 10°C, u phan u lah ban neh khlem pyut haduh kumba 3 ne 4 bnai lada ka jingshit ka long kumba 7°C ki phan ki lah ban neh haduh san bnai, lada ka jingshit ka long kumba 5°C ki lah ban neh haduh 7 bnai, hynrei lada ka jingshit ka long

tang kumba 2<sup>0</sup> C, kata u phan u lah ban neh bun snem. Mynta ba la don ka elektrik, kam long kaba eh ban thaw kum kita ki iing. Ka long kaba lah eh ban thaw ki ing thah (**cold storage**) kum kita da ka jingiarap ka elektrik.

Lada katei ka thapbalong ka long kaba pynjulong eh ia u phan symbai, ki ju pyniap ia ka da kaba pynjynhaw (**fumigate**) da ka tдем petrol, ne da ka karbon daisolphaid (**carbon-disulphide**) ha ki pipa kiba heh kiba shna na ka nar ne ka tin ne ka dew bilat. Kine baroh ar, ka petrol bad ka karbon daisolphaid, ki long kiba lah ban kem ding, kumta dei ban da sumar bha haba pyndonkam ia ki. Kane ka tдем jynhaw ka shu mih hi lada buh ia ki ha ino ino i jingdiang i bym don jingtap. Ki ju buh ruh ia kum ita i jingdiang ha khlieh jong u phan ha kita ki pipe. Kine ki pipe ruh ki dei ban long ki bym lait lyer.

Shaphang kino pat ki jaid phan kiba ngi lah ban thung ha ri Khasi-Jaintia nga lah ban ong ba ngi dei ban thung ia kito kiba ngi la shem ba ki long kiba bha na ka bynta kito ki jaka ha kiba ngi thung ia ki. La kumta ruh u nongrep uba peitmat u dei ban pyrshang man la ka por ia kiwei pat ki jait kiba lah ban ioh na kiwei kiwei pat ki jaka, bad lada u shem ba ki long kiba myntoi, un rep da kita kiba thymmai. Kiba kham kongsan na ki jaid phan kiba ngi shem ha ki ri lum ha kane ka ri India jong ngi bad kiba lah ban iadei bha ha ri Khasi-Jaintia ki long kine, **Magnum Bonum, Up-to-Date, Darjeeling Red Round, Royal Kidney** bad **Great Scot**. Ha ka jylla Assam ki briew imat ki kham iabeh ia kine, **Arran Consul, Factor, Up-to-Date** bad **Talisman**. Nalor kine ki jait symbai phan, mynta la don sa ki jait symbai kiba dang thymmai kiba kham lah shan (resistant) na ka jingpang iap-iong bad kita ki long u **Khufri Jyoti** bad u **Khufri Megha**.

Shuwa ba ngin pynkut ia kane ka lynnong nga kwah ban iathuh jyndat ia ki nongrep ha ri Khasi-Jaintia ba ki nongrep sha kiwei pat ki ri, kum sha Germany, ki ju ai masi ia u phan, ki shu ai im lane ki da shet ia u bad ki ju shna ruh kiwei-kiwei pat ki jingshna na u kum u **starch**, u maida. ka kynja kyiad



(**alcohol**), ka kynja shini (**glucose**), ki phan ba la pynrkhiang, bad kiwei-kiwei ki jingpyndonkam. Ia utei u starch, uba ki ioh na u phan da kaba tylliat ia u, ki khot **farina**. Ki pyndonkam ia u ha ki karkhana kiba shaitjain, lane na ka bynta ki dubi, lane na ka bynta ban shna ki kynja cake, ice-cream bad kiwei kiwei. Ia u phan lah ruh ban pynrkhiang hadien ba la ot lyngniap-lyngniap bad sa shna chips uba iaid bha ha iew.

## LYNNONG 10

### U KBA

U kba u long uwei na ki jingthung kiba donkam tam jong ka pyrthei. U long mynta u jingbam uba kongsan jong ka ri China, jong ki nong Japan, ki nong India bad kiwei kiwei ki briew jong ka ri mihngi. Ha ri sepngi ruh ngi shem ba don katto katne ka jingrep kba kum ha Italy, Spain bad ha ki bynta kiba kham shit jong ka ri America. Hangne ha ka ri India ka jingrep kba ka jur eh ha Andhra Pradesh, Punjab, Bengal, Tamil Nadu, Bihar, Uttar Pradesh, Madhya Pradesh bad Assam.

U kba u long u jingthung uba mih bha ha ki jaka kiba kham bun um. U kham met bha ha ki khyndew kiba skah (**heavy soil**). La katta ruh lada ka lyngkha ka don ka um kaba biang, bad lada ka don ki jingbam kiba biang na ka bynta u jingthung, kata ki dewra ruh ki lah ban pynmih u kba uba itynnad.

Kumba nga la ong ha ka lynnong kaba mynshwa, don bun jait ki jaid kba ha ka pyrthei. Don la kumno kumno kumba shi phew hajar ne palat ki jait kba ha ka pyrthei baroh kawei, bad ha ka ri India yn don palat ia ka san hajar ki jait kba. Kumta nga ngeit ba ka ri Khasi-Jaintia ruh ka don shibun ki jait kba, bad nga ngeit ruh ba ka lah ban ioh shuh kiwei ki jait kba na kiwei pat ki bynta jong ka ri India kiba kham bha ban ia kiba ka don mynta. Donkam namarkata ban pyrshang hi bun kiwei pat ki jait kba haduh ban da shem ia ki jait kiba bha tam na ka bynta ka ri Khasi-Jaintia.

Ha ri Bengal bad Assam la pyniakyrpang (**grouped**) pat ia kine ki jaid kba baroh kat kum ka rukom thung, ka por thung, bad ka jingdonkam um jong ki. Don namarkata u jaid kba uba ki khot u kba aus lane ahu uba ki shu bet beit ha ka pynthor bad u aus ne ahu uba ki da sara. Ia utei uba nyngkong ki ju thung ha Assam ha u bnai February, March bad April. Une u jaid kba um da donkam um eh shibun. Ki ju ot ia u ha Assam

na u bnai June, July. Ia u kba aus ne ahu uba ki da sara, ki ju thung ha ki jaka sara (**nursery**) ha u bnai April lane ha ka taiew kaba nyngkong u May bad ki sa thung pat ha pynthor hadien 20 haduh 30 sngi, bad ki sa ot pat ha u bnai August. Don pat u jaid kba uba ki khot u kba sali uba ki ju sara ha u bnai June-July bad ki thung pat ha pynthor ha u bnai July-August bad ki ot ha u bnai November, December. Uwei pat u jaid kba uba lah ban shem ha ka jylla Assam bad ha Bengal ruh u long u kba aman. Une u long uto u kba uba ki thung ha ki jaka ha kiba ka um slap ka lah ban tap ia ka pynthor haduh kumba 10 haduh 15 phut ha ka jingjylliew. Ia une u kba ruh ki ju thung naduh u bnai March haduh ka ba kut u May, bad ki ju ot pat haduh u bnai December – January. Uwei pat u jaid kba uba ki ju thung ha Assam u long uba ki khot boro. Ia une u kba ki sara ha u bnai November bad ki sa thung pat ha ki bir ha u bnai December-January, ki sa ot pat ha u bnai April – May.

### **Ki Rukom Thung Kba Ki Jingpang Bad Ki Khniang Kba:**

Ha ki bynta jong ka ri Khasi-Jaintia kiba khap ri dkhar (Assam) lehse lah ban thung ia kitei ki jaid kba baroh ha la ki jaka jaka katkum ka jinglong jong ki jaid kba ne ka jaka bad katkum ka jingbun jong ka um. Hynrei kiba kham bun na ki kba ha ri Khasi-Jaintia ki long lehse tang ar jaid (kata ar tylli ki group kumba ong ha ka ktien phareng). Kine ki long u kba lum bad u kba pynthor. Ia u kba lum ki ju bet ha ki ranab jong ki lum ynda ki la shyrti ia ki khlaw. Uba ar pat u jaid kba uba ki ju kham thung ha ri Khasi-Jaintia u long u kba pynthor uba ki ju bet ha ki hali kiba la ju shna bunsien ha ki them kiba long hapdeng ar tylli ki lum. Kane ruh ka long ka rukom thung kba ha ki lum jong ki paramarjan jong ngi ki Naga. Haba thung ha ki ranab lum ia u kba ki shu thung kumto ha ka khyndew kaba sngem da kaba ksam kumba shi inshi shiteng ne ar inshi hapoh khyndew. Hynrei haba thung ha ka hali, lah ban leh kawei na kine ar ki rukom (1) da kaba shu bet beit ha ki hali bad (2) da kaba thung ha ki sara. Lada shu bet beit ha ki hali, kaba bha eh ka long ban da pynspeh (**sprout**) ia u kba. Khnang ban pynspeh ia u kba, ki ju buh ia u ha ki byrni bad ki sa pynngam

ha ka um kumba 12 haduh 24 kynta. Hadien kata ki ju sei ia u na ka um bad ki sa jar noh ia ka. Ynda ka um ka la mih lut, ia kane ka byrni kba ki buh ha ka jaka kaba dum, bad habadei badei ki tap da u kynja skum (**straw**), bad ki sa ban khia daei-daei. Hadien kumba 24 kynta u kba ha kane ka byrni u sdang ban speh (**germinate**). Ka jingkloi ban speh ka shong na ka jingshit ne ka jinghun ka um. Lada ki speh (**sprout**) ki jrong eh, kane ka lah ban pynmysaw ia u, namar ki speh ki lah ban khein ha ka por thung. Ia une u symbai ki sa bet (**broadcast**) halor ka ktieh kaba jem ha kaba don ka um kaba tap iaka kumba shi inshi ka jingjylliew. Kane ka um ka iarap ia u symbai ba un ym ngam eh ha ka ktieh. Ynda la dep ka jingthung ki sa jiar pynrngat (**drain**) noh ia ka um na lyngkha. Hadien kata ki sa den um biang ha ka hali hadien kumba shisngi ne ynda u symbai u la sdang ban suh thied ha ka khyndew. Ha kane ka por dei ban da peit bha ba kan ym bun eh ne duna eh ka um. Ynda u kba u la jrong katto katne, ka um ka dei ban iai sah ha ka hali. Kane ka iarap ban iarap ia ki niut ki nier ha ka hali.

Ka rukom thung kba ha ki sara pat ka long ka rukom kaba kim da leh eh ha ka ri Khasi-Jaintia, ha ki por ba mynshwa. Kane ka long ka rukom kaba ki la shem ha kylleng ka pyrthei ba ka long kaba kham bha, la ka lah ban long ka bym myntoi eh ha ki jaka kiba ka dor bainong jong ki nongbylla ka long kaba heh. Balei u kba uba thung na ki sara u kham bha ban ia u kba uba shu bet beit ha ki hali, ka long ka jingkylli kaba ki riewstad ruh kim pat lah ban ai jubab kaba biang. Don kiba tharai ba kaba phut ia u kba na ki jaka sara (nursery) ha ka por ban pynkynriah ia ki sha ki hali ka long kumba ngor ia ki thied, bad kane hadien ka kham pynbun ia ki thied bad kumta lehse ka pynkhlain ia u jingthung. Don pat kiba ngeit ba ka jingbha jong u kba uba thung na ki sara ka long namar ba u kba uba thung ha kane ka rukom u ioh kham kylluid ka jaka ban ia u kba uba shu bet ha ka hali, kumta u ioh kham bun ka jingbam bad kham bun ka jingshai naduh ba buh ia u ha ka hali.

Lada thung kumta ha ki sara dei ban da thung ia u kba ha ki nursery. Kine ki norsari ki lah ban long ar rukom, (i) ka nursery

kaba shu sngem (**moist seedbed**) bad (ii) ka nursery kaba ktieh (**wet seedbed**). Ha ka nursery kaba shu sngem ki shu pynsngem ia ka khyndew da kaba ai um (**irrigate**) teng teng. Da kaba leh kumne ki sara ki lah ban sah kham slem ha ki nursery. Ha ki nursery kiba ktieh, kata kiba don kyrhai ka um, ki sara ki kham san kloi, bad dei ban thung ia ki ha ka por kaba biang, lynda kumta, ka por ka lah ban dier noh. Ki ngeit ruh ba ki sara ha ki nursery kiba shu sngem ki long kiba kham khlain ban ialeh pyrshah ia ki jingshitom ban ia ki sara na ki nursery kiba ktieh. Lada thung ha ki sara, u symbai ruh um da leit eh shibun. Lada 100-kilo u kba u leit ha ka shi hektar haba shu bet beit ha ki hali, da ki sara pat kan donkam tang kumba 50 kilo ne.

Ka nursery ka dei ban long ka jaka kaba kham sboh, bad kumba nga la pyni ha ki lynnong kiba sha khmat, ka sboh ka lah ban long ka eit masi, lane ka sla dieng kaba ki lum na kito ki jingthung lane ki dieng kiba ki khot ki **legumes** ha ka ktien phareng, lane u dpei lane ka sboh shyieng bad kiwei kiwei. Ka dei ruh ban long na ka khyndew ka bym da skah eh, namar ka long kaba shitom ban phut ia ki kba kiba dang rit ha ka khyndew kaba skah eh ne ka 'dew dait ha ka por pynkynriah ia ki sha ki hali.

Ynda kine ki sara ki la don kumba lai, saw ne san taiew ha ki nursery, la bit ban pynkynriah ia ki. Shuwa ban pynkynriah ia ki sha ki pynthor, donkam ban pynkhreh lypa ia ka pynthor. Ynda la lah lur lane puh ia ka pynthor, bad ynda la lah thiew ia ki nuit ki nier baroh bad ynda la pynmadan bha ia ki hali, ki sa ai um (**irrigate**) ia ki hali haduh ba ka um kan da dap kumba lai ne saw inshi. Nangta ki sa jynrat ia kita ki sara bad ki wallam ia ki sha pynthor. Ia kine ki sara lah ban thung kumba ar tylli man la ka thliew. Ki shu tynsat ia ki ha ka khyndew hapoh ka um, tang ba ka um kam dei ban tap ia u jingthung. Ka jingjingai ka dei ban long kumba 10 inshi na kawei ka thliew sha ka wei ka thliew bad kumta ter ter.

Ki pynthor ha ri Khasi-Jaintia kum ki pynthor kba sha kiwei ki bynta jong ka ri India, ki duna shibun ka naitrojen. Kumta

donkam ban da ai sboh ia kine ki pynthor ruh ha ka juh ka rukom, kumba nga la pyni haneng, na ka bynta ki nursery. Nalor kaba la shem ruh ba ki pynthor ha ri Khasi-Jaintia ki duna shibun ka phosphate, namarkata ka long kaba myntoi ban ai ka kynja sboh kaba don phosphate. La shem ba ka shyieng kaba la tylliat ka long ka sboh kaba bha tam eh ha ki pynthor kba ha ri Khasi-Jaintia na ka bynta u kba. Ka jingtrei jong ki shyieng ka long kaba suki katta katta bad lada ai sboh shyieng ha kawei ka snem lah ban iohi ia ka jingmyntoi ia u jingthung haduh ka snem kaba ar ne kaba lai ruh. Ka super-phosphate kaba nga la batai ha ka lynnong kaba kham ha shuwa ka long kaba kham um klooi ban ia ka shyieng. Lada ai da ka sboh shyieng, ai kumba 120 kilo shi hektar man la ka lai snem.

U kba uba thung da ki sara u kham duna shibun u nuit u nier ban ia u kba uba shu bet ha ka pynthor, hynrei la katta ruh, lada don ki nuit ki nier kiba iaknieh ia ka bam, ne kiba pynwit kumno kumno ia u kba, ia kita dei ban phut noh. Don bun ruh ki nuit ki bym lah ban mih hapoh um, kumta lada tap la ki da ka um, kin iap op.

Ha ri Khasi Jaintia don katto katne ki khniang kiba pynjutor ia u kba bad don ruh katto katne ki jingpang kiba ngi ju shem sha ri dkhar bad sha ri sepngi kiba pynjutor katto katne ia u kba. Kita ki long kine; (i) u 'niang pyrton (**swarming caterpillar-Spodoptera maurttia**), (ii) u paintaphieh (**ricecase worm-Nymphula depunctalis**), (iii) ka niangrynsi, (iv) ka niang dpei (**rice leaf hopper-Nephotettix apicalis**), (v) ka pang sarang (**blast disease -Piricularia oryzae**), bad bun kiwei kiwei ki jaid khniang bad ki jaid jingpang kiba ngim lah ban niew kyrting lut hangne.

U niang pyrton lane u 'niangkhung u long uba don ha kylleng ka ri India. Une u khniang u iaaid ha ki kynhun bad u trei ia ka kam pynjot jong u mynmiet, u shait pynjutor eh ia ki jintang kba kiba dangrit, mynsngi pat u rieh hapoh khyndew. Haba u dang rit, ka met jong u ka jyrngam hynrei ynda u la kham heh u lam byriong. Ynda kumba ar phew sngi naduh ba

u mih na ka pylleng u kylla niang long (**pupa**) bad hadien kumba khadsan sngi pat u mih na ka sop (**cocoon**) bad u kylla thapbalong (**moth**). Kane ka thapbalong ka iapoikha hapdeng shisngi ne arsngi bad hadien kata ka sa kha pylleng ha ki phlang ne ha ki jyntang kba. Ynda u mih na ka pylleng u sdang ban bam ia ki sla bad tang hapdeng khyndiat sngi u la jrong haduh kumba shi inshi shiteng. Kaba bha eh ka long ba une u khniang um lah ban im hapoh um. bad kumta lada ka um ka iaisah barabor ha ki hali, une u khniang um lah ban iohdong ban pynjulor than shibun. U shait pynjulor eh ia ki jyntang kba ha ki norseri haba ki dang rit. Kumta khniang ban iada na u, lah ban tih ia ka kharai da ka um bad ban theh khyndiat ka umphniang sharak ha kata ka kharai. kine ki khniang kin ym lah ban ryngkang ia kata ka kharai. Lada ki khniang ki la kiew ha u jyntang kba lah ban pynkhih ia ki da ki synrum dieng bad pynhap ia ki ha ka um ha kaba la theh katto katne ka umphniang sharak.

U paintaphieh pat u long u khniang uba lah ban im ha ka um ruh, bad u kham don ruh ha ki jaka kiba kham ktieh. Une ruh u long u kynja niangnuh, hynrei uba kham rit shibun ban ia utei u niang pyrton. Ynda u la heh bha u long tang kumba shiteng inshi ne, ka met jong u ka long kaba jyrngam. Une u bam ia ka sla bad u sa thaw iing ialade da kaba shna skum da ka sla, u shong hangta bad u im da kaba bam ia ki sla. Hadien katto katne sngi u sa kylla thapbalong. Kane ka thapbalong ka long kaba rit bad ka don ki thapniang kiba lieh kiba thohtak (**speckled**) bad saw brut (**brown markings**) na sharud ki thapniang. Ka ba bha eh ban ialeh bad kine ki khniang ka long ban pynhap ia ki skum jong ki bad ban pyniap ia ki. Ki ju leh ia kane da kaba pynkhih ia ki da kaba ring synrud da u tyllai halor ki jingthung kba, lane da kaba pynkhih ia ki da ki synrum dieng kumta ba kin hap ha ka khyndew kaba la pynrkhiang lane ha ka um kaba don katto katne ka umphniang sharak.

Kawei pat ka khniang kaba pynjulor eh ia u kba ka long ka niangrynsi kaba ki ong ha ka ktien Assamia, ka mowa poka. Kane ka khniang ka pynjulor ia u kba da kaba kjit ia ka um

hapoh ki sla ne na u symboh kba. Habadei badei ka kjit ia ka um na u kba haduh ban da sah sa tang u skop (**chaff**). Ka rong jong kane ka khniang ka long stem lam jyrngam, bad ka met jongka ka long syriem ia ka naingksem, ka pynmih ruh ka jingiw kaba syriem ia ka niangksem. Ka jingjrong jong ka na ka tdong sha ka khlieh ka palat khyndiat ia ka shiteng inshi. Ym don ka rukom kaba biang ban iada ia u kba na kane ka khniang hynrei lada ka bun eh lah ban shu synreit da ka **endosulphan 0.04%**.

Ka niang dpei ka long sa kawei pat kaba lah ban mih ha ki katto katne ki jaka haduh ba ka lah ban pynjutor ia u kba. Kane ka long ka khniang kaba kham rit ia katei ka mowa poka bad lah ruh ban pyniapher ia ka na katei ka khniang, namar kane ka long kaba kynthih na kawei ka sla sha kawei pat ka sla lada pynwit ia ka. Ka rong jong ka ka blad jyrngam lane ka lah ban iasyriem rong ia u dpei. Ia ka yn shem barabor hapoh ki sla, kata sha ka dong ka bym dei sngi, bad ka ju kjit ia ka um jong ka sla najan u thied bah jong ka sla. Kane ka khniang ka iabeh ia ka jingshai mynmiet. Kumta lah ban pyniap ia kane ka khniang da kaba thang da ki ding kiba rit sharud pynthor, kane ka khniang ka leit tur sha kine ki ding bad kumta ka thang ialade.

Ka jingpang kaba kham don eh ha u kba ka long katei kaba nga lah kdew haneng, ka pang sarang. Kane ka jingpang ka shait ktah eh ia ki mat jong u jyntang kba. Haba ka jingpang ka dang sdang, ka ktah shuwa ia ki sla, bad kine ki sla ki don ki jingthohdak kiba saw ha ki sla, bad ki don ka rong kaba jngut dpei. Ynda ka jingpang ka la jur bha kine ki jingthohdak ki lah ban ia pur lang haduh ba ka sla baroh kawei ka shu saw bthuh. Kane ka jingpang ka lah ruh ban ktah ia u ryndang jyntang kba, kumta ba teng teng u kba u khein noh hamar kane ka jaka. Haduh mynta ki riewstad kim pat lap ia ka buit ban pynduh ia kane ka jingpang, hynrei imat kaba bha eh ka long ban thung ia u jait kba (**rice variety**) uba kane ka jingpang kam lah ban pynjutor, hynrei ngim lah ban ong lada kine ki jait kba kin iadei ne em ha ri Khasi-Jaintia, kita ki long kine: **GEB.24, Co.1 bad Co.4.**



Ki don bun jaid kiwei pat ki khniang bad ki jingpang kiba pynjulong ia u kba ha kiwei pat ki bynta jong ka ri India. Hynrei ngam lah ban ong haduh katno kine kiwei pat kin pynlut ksan ia u nongrep ha ri Khasi-Jaintia.

Kumba nga la ong haneng u kba um da donkam shibun eh ka jingsumar ynda u la mih kumba shiphut ne. Kaba donkam ka long tang ban pynduh ia ki nuit bad ban ai ka um kaba biang. Ha ri Khasi-Jaintia don kyrhai ka um, bad kane ruh ka long kaba tad namar ka shu tuid arsut na ki lum (**gravitational flow**). Ka jingrep kba ha ri Khasi-Jaintia namarkata, ka long kaba suk shibun ha kawei ka liang.

### **Ka Jingot Kba Bad Kaba Buh Ia U :**

Ynda u kba u la jan ih bha ban pynrngad noh ia ka um na ki hali, khnang ba u kba un ih ryntih. Hadien katto katne sngi u kba u la bit ia ka ban ot. Ha ri dkhar ki ot kba da ka rashi (**sickle**). Ynda la ot ia u kba ki ju ieh ia u haduh ba un da rkhiang shuwa ban shoh ia u. Lah ban shoh kba da ki dieng rit ne khnap kumba ki ju leh ha ri Khasi-Jaintia, lane ban shu pyniuh da ki masi kumba ki leh ha ri dkhar. Ha ri America ki shoh kba da ki kor. Mynta wat ha ri India ruh la lah ban ioh ia kine ki kor bad la ju pyndonkam ia ki da ki nongrep ha Punjab bad kiwei de ki jylla kiba la kham paw khmat ha ka jingpynmih kba.

Khnang ban pyniakhlad ia u khaw na u skop kba pat ha ri Khasi-Jaintia ki shu dung ha u thlong, hynrei ha bun ki jaka ha ri dkhar mynta ki pyndonkam da ka kor kaba ki khot ka **huller**. Kane ka kor ka donkam ia ka enjin (engine) diesel lane ka elektrik. Kan long ka jingkykhu kaba khraw ia ki kynthei Khasi-Pnar jong ngi lada ki rangbah kin pyrkhat ban pyndonkam kum kine ki kor khnang ba ki kynthei kin lait na ka kam dung kba.

Ha ri Khasi-Jaintia ki ju buh kba ha ki thiar ne sub (ki shang kiba heh). Lada buh slem u kba u lah ban bam khniang. U khniang uba ju kham pynjulong eh u long u niang hati bam khaw (**rice weevil-Sitophilus oryzae**). Une u khniang u long

uba rit bad uba don ka khmut syriem ia u luta hati bad ki thapniang jong u ki long lam byriong. Kaba bha eh ban pyniap da kaba leh kumne, lah ban pyndonkam da ka kynja dawai kaba ki khot ka karbon baisulphaid (**carbon bisulphide**) kumba shi ounce kane ka dawai ha man la ka 15 cubit phut ka jaka buh kba. Hynrei dei ban kynmaw ba kane ka dawai ka long kaba kem ding bad kaba bthei haba kem ding, kumta dei ban da tip bha kumno ban pyndonkam ia ka.

### **Ki Jingbam Na U Kba :**

Na u kba ngi ioh ia u khaw uba long u jingbam ba kongsan tam jong ki briew ha ki ri mihngi. Hangne ha ri India ki briew kiba na sha ki thain mihngi, shatei lam mihngi bad shathie ki long kiba bam bun eh u khaw ban ia kiba na sha kiwei pat ki thain. Bad namar ba u Khasi-Pnar, uba dei na ki thain shatei lam mihngi, u pyndonkam shibun ia khaw ha ki jingbam jong u, kumta nga ngeit ba ka long kaba dei eh ia u nongrep Khasi-Pnar ban sngewthuh bha aiu lah ban ioh na u kba bad na u khaw lane na ki jingbam baroh ki ba shna na ki.

U khaw uba ngi ioh na ki mill (karkhana) kiba tyllait kba u long uto uba la pyniakhlad ym tang ia u stait, hynrei uba ki la shim noh katto katne ia i jinsop (**pericarp**) jong i symboh kba bad i khmat kba (**embryo** lane **germ**), iba long i bynta i ba don shibun ka jingbam kaba donkam na ka bynta ka jingkoit jingkhiah jong u briew. U khaw dkhar (**milled rice**) namarkata um da long uba bha eh na ka bynta ka met u briew kum u khaw dung thlong. Dei na kata daw ba kiba bam khaw dkhar bunsien ki shait ioh ia ka jingpang at (**beriberi**). La kumta ruh u jait khaw baroh u duna ka kalsiom (**calcium**) ka met tynrai kaba donkam shibun na ka bynta ka met u briew bad kaba iarap ban tei ia ki shyieng.

Lada dung ia u kba ynda la lah pdem shuwa ha ka um shipor bad sa shet ia u, kata ka jingkhlain jong u kum u jingbam kam da duh eh. Ia u khaw uba ki shna ha kane ka rukom ki khot u khaw snar lane, ha ka ha ka ktien phareng u **parboiled rice**. Tang ka jingshna ia une ruh ki iapher na kawei ka jaka

sha kawei pat. Ka rukom shna kaba suk eh ka long kumne: Ia u kba ki buh ha ka tin umphniang sharak lane ha uno uno u kynja khiew bad ki sa pyndap da ka um bad ki eh hangta kumba shi sngi ar sngi katkum u jaid kba. Hadien kata ki sa tiew ia kane ka tin lane khiew halor ka ding bad ki sa pynshit ia ka um haduh ba kan da thnam. Ynda u kba u la sieb katto katne bad u la sdang ban jem (lah ban ithuh ia kane da ka jingbthei jong ki katto katne ki symboh kba) ki sa theh noh ia ka um bad ki sa pynrkhiang ia u kba nangta ki sa dung pat ia u ha u thlong.

Ha Punjab pat ia une u khaw ki shna ha kane ka rukom harum. Ki shet ia u kba bad ka um kumba 24 kynta halor ka ding kaba shu rhem da kaba thang tang da u skop kba. Nangta pat ki sa sei ia u kba, ki khleh bad u shyiap bad ki sa sdieh (**roast**) ha ka ding kaba meh bha kumba 5 minit. Katba ki dang sdieh ki king tat shaid shi shaid. Nangta pat ki thad ha ka sngi haduh ba un da rkhiang bha shuwa ban dung ia u.

Don bun ruh ki rukom ki bapher bapher ha kaba shna ia une u khaw, hynrei ngam lah ban batai lut hangne. Nga la batai ia kitei ar tylli ki rukom namar nga ngeit ba kan pynmyntoi ia ka ri lada ngi lah ban leh kumtei bad kan pynmyntoi ruh ia ka koit ka khiah. Ki riewstad ki ngeit ba da kaba leh kumtei ki vitamin bad kiwei kiwei pat ki jingbam ki ba donkam ia ka met u briew, ki ngam noh hapoh u khaw bad kin ym duh noh haba khlur ia u snep najrong ha ka por ba dung ia u.

Nga sngew dei ruh ban pyni hangne ia u khaw ryngkew, kata u khaw uba ki ioh na u kba lu ne u kba uba ki thung ha ki lyndum rkhiang, u kham bha ia ka met u briew ban ia u khaw uba ki ioh na u kba pynthor. Ki ju ngeit ruh ba u khaw saw u kham bha ban ia u khaw lieh, lehse namar ba u 'pu khaw (**bran**) jong u khaw saw u kham rben ban ia u jong u khaw lieh. Dei ruh kane ka syrtap jong u symboh khaw kaba don shibun ka jingbam kaba bha na ka bynta ka met u briew, kum ki bitamin, protein, khlein, phosphorus bad kiwei kiwei ki mineral. U khaw dkhar (**polished rice**) um don ei ei lait na u starch, katto katne ka protein bad katto katne ki mineral.

Na u kba don ruh katto katne ki jingbam kiba ki ju shna kum u khoi bad u shira. Don ar jait ki khoi, uwei uba ki shna na u kba bad uwei pat uba ki shna na u khaw. Ia u khoi uba ki shna na u khaw ki ju khot ha ka ktien Bengali u **muri** bad ha ka ktien Hindustani u **murmura**.

Ia u khoi uba ki shna na u kba ki shna kumne: Ia u kba ki thad shuwa kumba 8 kynta ei ei. Ia une u kba pat ki buh ha ki khra kyndew kiba heh bad ki sa theh da ka um khluit ha kita ki khra. Hadien ar minit ki theh noh ia kata ka um bad ia kine ki khra ki sa pynieng khongpong baroh shimiet. Katba u kba u dang sngem ki tylliat ia u bad katba ki nang tylliat ki nang pynkhluid ia u shyiap ha ka nar. Ynda ka nar bad uta u shyiap ki la khluit bha ki sa shim kumba lai ne saw kham uta u kba ba la tylliat bad ki thep ha kat ka nar da kaba king war shi war da ka siang kaba jrong. Hadien katto katne por ki symboh kba ki sa bthei bad ki sa rah noh ia ki na ka nar bad ki sa pynkhlad ia u shyiap na u khoi. Hadien katta ki sa peh ia u skop kba. Ia ki kba ki bym bthei ki ju pynkylla khoi da kaba pyniakhlad ia u khaw na u skop kba bad une hadien u long u khoi muri.

Ia une uba ki shna na u khaw pat ki shu shim beit da u khaw bad ki thep ha ka nar kaba don utei u shyiap uba la pynshit lypa kumba la batai haneng, bad ki king war shi war kumba ki leh na ka bynta utei u khoi uba la batai haneng. Ynda u khaw u la bthei ki sa sei noh na ka ding bad ki sa pyniakhlad ia u khoi na u shyiap da ka shalani. Ia une ruh ki khot u khoi muri.

Ia u shira pat ki shna ha kane ka rukom: Ia u kba ki pdem ha ka um kumba ar ne lai sngi haduh ba un da jem. Nangta ki sa shet ha ka ding katto katne minit, bad ki sa rah noh na ding. Ynda ka um ha kaba ki shet ia une u kba ka la khriat ki sa jiar noh ia ka. I u kba pat ki buh ha ka nar kaba lynghung kum ka nar karai ba shet jyntah (**concave vessel**), bad ki sa tiew biang ia une u kba haduh ba un da pyrthiew. Nangta pat ki sa dung haduh ban da iakhlad u skop na u khaw shira bad ki sa peh ha u prah.

Shi kyntien ngi dei ban ong ei ei ia u khaw biruin uba ki ju

thung ha ri Khasi Jaintia. Ia une u khaw ki khot ha ka ktien phareng **glutenous rice**. Kane ka ai jingmut ba une u khaw u don shibun ka kynja met kaba ki khot ha ka ktien phareng **gluten** bad kaba iapher na u starch. Hynrei ha ka jingshisha um dei u gluten. U dei hi u starch tangba ha kawei pat ka rukom lane ka dur.

Ha kaba kut ngi dei ban ong ba lada ka ri Khasi Jaintia ka kwah ban rep ia u kba uba ka thmu ban die shabar ka ri, kata ka dei ban rep da u kba uba rit symboh lshir lshir. Ha ri dkhar ki khaw kiba rem ki dei kito kiba rit symboh (**fine rice**), bad kito kiba heh symboh (**bold rice**) ki long kiba tad eh. Na kito kiba rit symboh don pat katto katne ki jait kba kiba ki ju ia beh eh ha kane ka ri India, kum u khaw **kalma** na Bengal lane u khaw **basmati** na Dehradun. Ngi ngeit namarkata ka long kaba myntoi ia u nongrep ha ri Khasi Jaintia ban pyrshang rep da u khaw basmati, namar ba ka jinglong ka ri Khasi Jaintia ka ia syriem ia ka Dehradun.

## LYNNONG 11

### U RIEWHADEM

U riewhadem u long pat u jingthung ia u ba la wallam sha kane ka ri India na America lehse ha ka por ba ka wan ka **East India Company** . Naduh ba la shem ia ka ri America u la phriang kylleng ka pyrthei, ba mynta u long u jingthung uba ki ju thung ha kylleng ki ri jong ka pyrthei, kum ha ka United States of America, ha Romania, Italy, India, Hungary, South Africa bad Egypt. Ha kane ka ri India, ki jylla kibā kham thung shibun eh ki long kumne ter ter, ka Uttar Pradesh, ka Bihar, ka Punjab, ka Rajasthan, ka Gujarat, Tamil Nadu, ka Bengal bad kiwei kiwei. Ka jylla Meghalaya kam da thung shibun kum kitei ki jylla jong ka ri India lait tang ha ka ri Khasi - Jaintia. Kumta ngi sngew dei ban niew ia une u jingthung kum uwei na ki jingthung kiba kham donkam ha ki ri lum Khasi - Jaintia.

#### **Ka Jingiapoikha ki Riewhadem :**

U jingthung riewhadem u don ar rukom ki syntiew, u symphiah uba ha khlieh jong u jingthung riewhadem u long u syntiew shynrang, bad uto pat uba hamar shiteng u jingthung u dei u syntiew kynthai bad dei une uba hadien uba bah khun. Ki symbai shynrang kiba rit katta katta kum u phngit (**pollen grains**) ki lah ban hap na utei u syntiew shynrang ha ki tmain (**silk**) jong u syntiew kynthai jong u juh u jingthung lane jong u wei pat u jingthung riewhadem, bad ynda ki la iapoikha, hangta ki symboh riewhadem ki sa sdang ban nangheh. Lynda ki ia poikha kumne ki symboh riewhadem kim ju long bad dei namarkata ka daw ba teng teng ngi ju iohi ha ki kop riewhadem katto katne ki bym shym long symboh. Bad namar ba ia ki tei ki phngit symbai (**pollen grains**) la kit da lyer, kumta ka long kaba donkam ban kynmaw ba lada thung tang shi lain lane wat ar lain ruh lada jur eh ka lyer ka lah ban kit ia kine ki phngit sha jngai bad ki lah ban nym hap ha kita ki riewhadem

kiba hajan. Dei ban kynmaw pat ba namar ba ka lyer ka lah kit ia une u phngit sha jngai bad lada ki la ia poikha, kata kin mih bun jaid ki khun kiba lah ban long kiba ngim kwah satia. Ki nongrep riewhadem kin kynmaw ba ha uwei u kop riewhadem ki lah ban ioh ia ki symboh kiba ia pher ki rong. Kane ka pynl ba kawei ka rong ka wan na uwei u riewhadem, bad kawei pat ka rong na uwei pat u riewhadem. Hynrei kane ka jingiapoikha khleh ka lah ruh ban long kaei kaei kaba myntoi shibun. La shem ba haba ar jaid ki jingthung lane ki mrad ki iapoikha, ki khun jong ki bunsien ki long kiba kham khlain ne kham bha ban ia ki kmie ki kpa.

Tharai mynta don kawei ka jaid masi (**breed of cows**) kaba ai dud ong kumba san kilo shi sngi, bad kawei pat ka jaid (**breed**) kaba ai phra kilo shi sngi. Lada kine ki jaid ki iapoikha khleh, kata lada u masi shynrang na kawei ka jaid u iapoikha bad ka masi na ka wei pat ka jaid (**breed**) ka ba ai phra kilo shi sngi, ki khun kynthai kiba mih na katei ka jingpoikha ki ju kham ai dud shibun ban ia ka kmie lane kino kino ki kmie na kata ka jaid. Kane ka jinglong ka neh tang ha ka pateng kaba nyngkong. Kum ia kane ka jinglong kaba ngi iohi ha ki jingthung bad ki mrad, ki riewstad ki khot **hybrid vigour** ha ka ktien Phareng. Kumta ka long kaei kaei kaba ki ju leh ha ki ri ba la kham pawkhmat (**advance countries**) bad ha kiwei ki jylla jong ka India (kum ka Uttar Pradesh) ban pyniapoikha hapdeng ar jaid ki riewhadem, kumta ba ki khun kiba mih na kane ka jingiapoikha ki long kiba kham bha bad kham khlain ban ia ki kmie ki kpa. Ngin batai hangne kumno ki leh ia kane khnang ba ki nongrep kiba peitmat ha ri Khasi Jaintia ruh ki lah ban pyrshang ban pynmih kum uta u symbai uba lah ban pynmih ki jingthung riewhadem kiba kham bha. Ka jingkhail ia ki symbai kiba kum kine ka long kaba myntoi shibun.

Tharai mynta la don ar jaid ki riewhadem u 'A' bad 'B' bad kiba ngi la shem ba lada kine ki ar jaid ki iapoikha kata ki khun jong ki ki kham bha ban ia u "A" lane "B". Ia kine ki ar jaid ki riewhadem ngin thung ha kane ka rukom. Ia u riewhadem "A" ngin thung ha kawei ka lyngkha kaba ia jngai na kiwei pat ki

riewhadem, kumta ba u symbai jong u un long barabor u bym iakhleh bad kiwei. Ha kawei pat ka lyngkha ngin thung khleh ia kitei ki ar jaid ki riewhadem kumne: ha uwei u lain ngi thung ia u “A” ha uwei pat u lain ngi thung ia u “B” bad kumta ter ter baroh shi lyngkha. Ha ka por phuh syntiew pat ia ki symphiah jong u “A” ngi ngor noh kumta ba un sah tang u syntiew kynthei. Kumta u “A” u lah ban iapoikha tang bad u “B” uba la don marjan bad u. Hynrei u “B” pat um lah ban iapoikha bad u “A” namar la ngor noh ia ki syntiew shynrang jong u “A”, kumta u “B” la u iadon marjan bad u “A” ruh u shu sah hi u “B”. Ia ki symbai riewhadem kiba ngi ioh na u riewhadem “A” na kane ka lyngkha kaba ar ngi iohi namar kata ba ki long kiba shiteng jaid bad kine ki lah bunsien ban pynmih ki riewhadem kiba kham bha ban ia u “A” lane “B”. Hynrei ngi dei ban leh ia kane man ka snem. Ngì dei ban buh ia u “A” bad u “B” la ka jong ka jong, namar ki ksiew na u “A” bad na u “B” kim long kiba kham bha ban ia u “A” lane u “B”. Ia u riewhadem uba ngi ioh da kaba leh kumtei ki khot ha ka ktien phareng **hybrid maize** lane u riewhadem shiteng jaid.

### **Ki Jaid Riewhadem :**

Don bun jaid ki riewhadem, hynrei ia baroh ki jaid ba juh kham thung la buh ha ki san tylli ki klas kumne: 1. U riewhadem pyrthew (**pop maize**) 2. U riewhadem jem (**soft maize**) 3. U riewhadem shini (**sugar maize**) 4. U riewhadem lynghong thliew (**dent maize**) 5. U riewhadem mawshamok (**flint maize**). Utei u jait uba nyngkong u don u tyllong uba rit bad ki soh ruh ki long kiba rit bad ki shait pyndonkam eh ha ri America ban shna riewhadem pyrthiew. Uba ar pat u don u symboh uba jem bad ka snep ruh ka long kaba jem. Uba lai pat u long uba thiàng tam na ki jait riewhadem baroh. Ia une ki shait pyndonkam ha ri America bad ha India ruh kumjuh ban bam tang shu shet thai ia u. Ki symboh jong une u riewhadem ki long kiba sti (**wrinkled**) ynda la thad rkhiang ia u. Ka daw ka long ba katba ka um shini ka dang don hapoh u riewhadem kata u dang dap sngaid, hynrei ynda la mih noh ka um shini bad sah sa tang ka shini hapoh u symboh, hangta u



sa sdang ban sti. Kane kam long ha kiwei pat ki symboh riewhadem namar kim don shini shibun kum une, hynrei ha ka jaka ki shini ki don da u starch. Na ka bynta ban bam u briew, une u long uba kham bang shibun ban ia kiwei pat ki jaid riewhadem. Hangne ha ri India ka Kashmir ka thung shibun ia une u jaid riewhadem, bad namar ba u iadei bad kata ka jaka. Ngim don jingartatien ei ei ba un iadei ha ri Khasi – Jaintia ruh. U riewhadem lynghong thliew u long pat u riewhadem uba ki shait rep eh ha ri America. Ki khot kumta ia u namar ba ha khlieh jong iwei-pa-iwei i symboh riewhadem jong une u jaid, don i thliew rit iba ia syriem ia I thliew ba la pynlong da kaba dung da u prek na ka khlieh jong iwei-pa-iwei I symboh. Na une u jaid riewhadem ki ju shna bun jaid ki jingbam kum kito ba ki ju bam mynstep (**cereals**), lane ki shna ata (**flour**). Utei u jaid riewhadem uba san pat, uba ngi la khot u riewhadem mawshamok, u long uba kham kynrei eh ha kane ka ri India bad u long uba ki ju thung ha ri Khasi-Jaintia. Une u riewhadem u don ka snep jong u symboh kaba eh katta katta bad kaba jlih.

### **Kaba Thung Riewhadem :**

U riewhadem u long u jingthung uba long ha ki khyndew kiba sbur bha ki bym don bun eh ka um lane ki bym da rkhiang eh. Um lah ban long ha ki jaka kiba lang ka um (**water logged soils**). Hynrei ki 'dewra lada ki ioh biang ka um bad lada ki biang ka sboh ki lah ban long kiba bha na ka bynta une u jingthung. Une u jingthung u dei ruh ban ioh ka um kaba biang bad ka sboh kaba biang khamtam ha ka por kaba u dang san. Dei namarkata ban ai bha ka sboh, bad shuwa ban thung ia u, dei ban ai da ki kynja sboh kum ka eit masi. U donkam ruh ban ym don shibun ki nuit kiba lah ban iaknieh ia ki jingbam.

Ha ri sepngi ki thung ia une u jingthung bunsien ha ki lain kumta ba ka long kaba jem ban phut ia ki nuit da ka kynja kor kaba ki khot ha ka ktien phareng ka **grubber** ne **cultivator**. Kane, kumba nga la pyni ha ki lynnong kiba mynshwa, ym tang haba thiew ia ki nuit, hynrei ka lah ruh ban kynton khyndew. Ia kane ka kor lah ban ring da ki masi dab kumjuh

kumba ring ia ka lyngkor. Haba thung, buh kumba ar phut shiteng na kawei ka kynton ha kawei pat ka kynton ha u lain. Ki bnai kiba bha eh ban thung riewhadem ha ri Khasi-Jaintia ki long ha u April bad May. Ka Sorkar mynta, ka la pynshlur ruh mynta ban thung ia u riewhadem tlang kum ha ki jaka ki ba kham syiad bad ha ki jaka kiba biang ka um, kum sha Bhoi.

Ki thied jong u riewhadem, kum ki jong u phan, ki donkam shibun ka oksijen ha ka por ba u jingthung u dang san, dei namarkata ka daw ba u riewhadem, u donkam ka jingkara ar sien ne lai sien khnang ba ki thied kin ioh lyer. Ia ka jing kara kumne, khnang ba u jingthung un ioh lyer ki khot ha ka ktien phareng **aeration**

U riewhadem kum ki jingthung baroh u don shibun ki jingpang kiba pynshitom ia u, hynrei imat kine kim da pynjulor eh haduh ban da pyndonkam kano kano ka lad ban pynduh ia ki. Na ki khniang pat kiba ju pynjulor ia u ruh ym da bun eh, ia kaba ngin pynshitom jingmut eh ia ka ban pynduh ia ki. Dei namarkata ka daw ba ki riewstad hangne ha ri India kiba pule ia ki khniang (**entomologists**) kim pat shym leh ei ei na ka bynta une u jingthung. La kumta ruh ngi ngeit ba ki khniang kiba bam ia u jyntang riewhadem ki don ha ka ri Khasi –Jaintia kumba ki don sha kiwei pat ki ri. Kine ki long ki khniang kiba bunsien ki tur sha ka jingshai mynmiet. Lah namarkata ban pyniap ia ki da kaba thang ha ka por janmiet ki ding sharak kiba rit harud lyngkha riewhadem ha ka por ba kine ki khniang ki wan ban kha pylleng ha ki jyntang riewhadem.

Ia u riewhadem ki ju thung ha ri Khasi – Jaintia tang na ka bynta ban bam ia u soh riewhadem. Hynrei ha kiwei kiwei pat ki ri bad kiwei pat ki bynta jong kane ka ri India ki ju thung ruh ia u khamtam na ka bynta ki jingri. Ha kane ka ri India ki ju pyndonkam ia ki jyntang riewhadem ban shna jingbam masi da kaba ki ot rit lyngkhot lyngkhot ia u jyntang bad sa ai beit ia ki masi. Ki ju ai ruh ia kine ynda la buh katto katne bnai ha ki thliew (**silo**) kiba ki la shna kyrpang. Ki ju leh ia kane ban ioh jingbam ia ki masi ha ki por ba kyrduh jingbam.

Lada pyndonkam ia u soh riewhadem na ka bynta ban shu bam kumto ynda shet thai lane da kaba shu thang, ia u soh riewhadem ki kheit ha ka por ba ki kop (**huoko**), ki dang jyrngam, bad ki symboh kim pat ih-eh. Hynrei lada kheit ia ki khnang ban buh symbai, don kam ban ieh kham slem ia u soh riewhadem ha lyngkha haduh ba un da ih bha. Bad katba u symboh u nang rkhiang bha, katta u nang bha ban buh symbai.

Lada thung ia u riewhadem tang na ka bynta u jyntang ban bsa ia ki masi, kaba bha ka long ban ot ia u naduh kjat ha ka por ba ki riewhadem ki la sdang ban long symboh. Hynrei lada thung khnang ban bsa ia ki masi da u jyntang riewhadem da kaba buh ha ki thliew (**silo**) kumba la ong haneng, kata dei ban ot ynda ki symboh ki la heh bha. Hynrei lada thung pat ia u riewhadem na ka bynta ki soh, bad na ka bynta ban ai masi, donkam ban ot ia ki jyntang tang shu lah kheit ia ki riewhadem. Ka jingkheit riewhadem ha ri Khasi-Jaintia ka sdang naduh u bnai July.

Ka jaka buh symbai riewhadem ka dei ban long kaba rkhiang bad ioh lyer bha. Lada jur eh ka jingsngem bad jingshit, ki riewhadem ba buh symbai ki tlot bor noh.

## LYNNONG 12

### U PAI

U pai u long u jingthung uba ngim pat da thung bha ha ri Khasi-Jaintia, hynrei uba nga ngeit ba un nang roi nang roi, lada ngi nang ban pyndonkam ia u kumba ki leh sha kiwei kiwei pat ki jaka.

Ki riewstad kim pat lah ban ong thikna ha kano ka jaka u pai u mih nyngkong nyngshap eh. Bun ki ngeit ba don ar tylli ki jaka ha kiba u pai u mih nyngkong. Ka ri Assam bad Bengal lehse ka long kawei na ki iing kiba nyngkong jong u pai. Lehse u pai u la mih na uwei u phlang uba ki khot u **kas** ha ka ktien **Hindustani**, u phlang uba ia syriem ia u khah bad uba don kyrhai ha ri Bengal bad Assam. Kawei pat ka jaka kaba ki ngeit ba ka long ka iing kaba nyngkong eh jong u pai ka long ha ki dewlynnong kaba don shaphang shathie lam mihngi jong ka Asia. Lehse ki dewlynnong New Guinea ki long kita ki jaka. U pai uba mih ha Assam bad Bengal u long uba kham rit met ban ia u pai uba mih ha kato ka dewlynnong. Hynrei ha kine ki phew snem kiba hadien ki riewstad ia kiba ki khot ki **plant breeders** ki la pyniapoikha ia kitei ki ar jaid ki pai kiba ngi don mynta ha kane ka ri India. Ki khun kiba mih na katei ka jingpoikha ki long ki bym da rit met eh bad da rben eh kum kito kiba ki la wallam na kitei ki dewlynnong kum na Java.

### U Pai Ha Ri Khasi bad Shawei

Don mynta ha ka Jylla Meghalaya kumba 80-86 hektar ha kiba ki thung pai, bad ha ka kane ka jylla ka jingrep pai ha kaba ia nujor bad kiwei pat ki jylla jong ka ri India ka dang duna shibun. Hynrei, nga ngeit ba ka jylla Meghalaya ka long kawei na ki jylla jong ka ri India ha kaba u pai u lah ban long bha. Kawei na ki daw balei ba ngi ha Meghalaya ngim thung pai kumba thung sha kiwei pat ki jylla ka long, kumba nga la ong haneng, ba ngim pat nang ban pyndonkam ia u pai na ka

bynta ban thaw shini lane **gur (mithai)**, kumba ki leh sha kiwei pat ki bynta jong ka ri India. Ha ka jylla Uttar Pradesh don kumba ar milian hektar u pai, bad dei kane ka jylla kaba pymmih shibun eh ka shini bad ka gur ha kane ka ri India. Ka jingroi ha ka jingrep pai ha kane ka jylla bad ha ki jylla kiba ia khap bad ka kum ka Punjab bad ka Bihar ki la stet katta katta ha ka jingpynmih shini, bad ka ri India mynta ka long kaba khraw tam ha ka pyrthei baroh kawei ha kane ka liang. Lada, ki nong Meghalaya kin iarep pai kham bun ha kine ki snem ki ban wan, nga ngeit ba ka jylla jongngi ruh kan long kaba khlain ban pynmih shini kum kiwei pat ki jylla ha ri India.

Ka ri Khasi – Jaintia ka long, kum ka jylla Assam baroh kawei, kaba bit shibun ban thung pai. Ka jingshit jingkhriat ka long kaba bit bha na ka bynta une u jingthung, u slap ruh u biang bha. U pai u long bha ha ki jaka syaid bad ha kiba u slap u hap ym duna ia ka 5000mm. shi snem. Lah ruh ban thung ia u ha ki bun jaid ki khyndew, lait sa tang ki dew dait ne dewktieh, ne ha ki khyndew mawsiang ha kiba ka khyndew kam da jylliew eh. Ki khyndew kiba bit eh ki long kito ki bym da dait eh lane ki bym da long dewra eh, bad kiba don ka sbob kaba biang. Ha ki jaka kiba ka um ka shu neh hajuh (**water logged soils**) ruh, u pai um long.

### **Ki Rukom Thung Pai :**

Ia, u pai lah ban thung ha ki bun rukom. Ha ka jylla Assam imat kaba ki ju leh ka long ban shim ia ki kshai pai. kata ki khlieh (**tops**) jong u pai bad ki sa pynspeh ia ki da kaba buh ha ki jaka sara lane ha ki jaka sngem harud pung bad ynda ki kshai ki la speh bha, ki sa rat ia ki bad leit thung sha lyngkha ha ki thliw kiba long kumba 9 ne 10 inshi ka jingjylliew bad ha ka jingjingai kumba shi phut shiteng lane ar phut na kawei ka thliw ha kawei pat. Habadei-badei ha ki jaka kiba ki dang shu lah shyrti thymmai ki shu thung beit ha ki thliw ia kine ki kshai khlem da sara.

Ha ki jaka madan pat, ha kiba pahuh ka um, ha kylleng ka ri dkhar ki ju thung ia u pai kumne. Ki lur ia ka lyngkha bad pynmadan bha ia ka. Ia u pai pat ki ot lyngkhot lyngkhot, ki da

ieh lai-lai mat, bad ia kine ki lyngkhot pat (**sets**) ki tep hapoh ka khyndew ha ka jingjylliew kumba shi inshi ne ar inshi bad ki sa ai um ia ka lyngkha. Haba thung, ki ju thung ia ki pai ha ki lain ha ka jingjingai kumba shi mitar ei ei na uwei u lain ha u wei pat, hynrei ia kine ki lyngkhot pat ki shu pyndem ter ha u lain bad ki da pyniakynduh ia iwei i lyngkhot pai bad iwei pat. Haba ki thung ha kane ka rukom ki pyndonkam ym tang ia ki kshai pai kum ha katei ka rukom kaba la batai haneng, hynrei ki pyndonkam ia u pai baroh uwei. Ia kane ka rukom thung pai ki khot ka **flat lane ka level method** ha ka ktien phareng.

Kawei, pat ka rukom thung ha ki jaka madan ka long kaba ki khot ha ka ktien phareng ka **ridge and furrow method** kata ka mut ka rukom thung ha ki **nur bad kynton**. Kata ka long kumne. Ynda la lur bha ia ka lyngkha bad ynda la ai sboh bha ia ka da kito ki sboh kiba ngi la batai ha ki lynnong kiba mynshwa, ki thaw nur da ka lyngkor kaba lah ban shna nur kaba ki khot ka **furrower**. Kane ka long ka lyngkor kaba lah ban ruid ia ki nur bad ban kyndat khyndew baroh arliang. Ia kine ki nur ki ruid ha ka jingjingai kumba shi mitar shiteng na kawei ka nur sha kawei pat. Ha ka por thung ki ot ia ki pai **lyngkhot lyngkhot** kumba la batai haneng bad ia kine ki buh pynthiah ha kine ki nur bad ki sa tep khyndew ia ki pat da u mohkhiew ne u kynja mohkhiew uba rit bad jrong u sping uba ki khot ha ka ktien phareng **hoe**. Lada ka khyndew ka rkhiang ki sa ai um tang shu lah thung. Hadien kata pat ki sa ai um tang teng-teng kat kum ka jingdonkam ka khyndew.

Kawei, pat ka rukom kaba ki ju leh ha Java bad ha ki katto katne ki jaka ka long kaba ki khot ka **trench method**. Kata, ha ka jaka jong ki nur (**furrow**) kumba ki leh ha katei ka rukom kaba la batai haneng, ki shna da ki nur kiba kham heh shibun, haduh ba la lah ban khot ia ki kharai. Ki leh kumne ha Java namar ka khyndew ha kato ka jaka ka long kaba tuid na ki lum mihding (**volcanoes**) bad katba nang tih jylliew katta ka nang bha ia ki jingthung. Kumta kine ki kharai ki long kumba shi phut ka jingjylliew bad hadien pat ki sa kynroi shuh shuh ia ka khyndew kaba ki la kynroi kumba la ong haneng. Haba ki thung

kumne ka jingngai na kawei ka kharai ha kawei pat ka long kumba lai phut shiteng lane saw phut.

Na, kine ki rukom thung baroh, la shem ba kane kaba khadduh ka long ka rukom thung kaba bha tam eh, kata, ka jingmih u pai na kaba thung kumta ka long kaba bha tam. Hynrei ha bun ki jaka ha ri India ki shem ba ka long kaba kham myntoi ban thung da katei ka rukom kaba lai, namar ka jinglut ha ka por thung ka kham duna haba thung kumtei ha ki nur kiba lah shna da ka lyngkor.

Na ki jingthung baroh kiba ki thung ha ri India lehse ym don uwei pat u jingthung uba kham donkam ai sboh palat ban ia u pai, namar katba nang ai sboh bha ia u, katta ka jingmih ka nang jur. Ha bun ki bynta ka ri India ka jingmih na u pai shi hektar ka long tang kumba 40-50 ton. Hynrei, lada thung ha ka rukom kaba dei bad ai sboh ia u, u la ju mih haduh 160 ton shi hektar. Lada ai sboh da ki rukom jingthung kum da u saihon (**sun hemp**), lane u dhiancha (**Seshanta ocoleata**)u rymbaija lane u cowpea ia kine baroh dei ban thung shwa ban thung ia u pai, hadien kata sa puh kylla ne tep ia ki da ka lyngkor hapoh khyndew. Lada biang ka jingsngem ka khyndew, lah ban thung ia kine ha ki jaka kiba khap Assam lane ha ki jaka syiad ha kano kano ka por bad ban puh kylla ruh ha kano kano ka por, lait tang ha ki jaka kiba kham khriat eh. Lada ai da ki sboh shaba kiba nga la pyni ha ka lynnong kaba mynshuwa, ia kine lah ban ber ha ki nur khyndiat sngi shuwa ban thung ia u pai. Hynrei lada ai da ka sboh dawai kata dei ban ber ia ki ha ka por ba u pai u dang sei bad dang lung bha.

Ha kiwei pat ki bynta jong ka ri India ka jingai um ia u pai ka long kawei kaba donkam shibun eh; hynrei ha ri Khasi-Jaintia nga ngeit lah ban thung pai khlem da ai um (**irrigate**).

Ynda u pai u la mih, ka donkam ban kynton ia u khnang ba un ym thiah bad ba un ioh ruh shibun ka sboh lane ka jingbam kaba don ha ka khyndew. Don ki jaid pai ruh kiba kham thiah (**lodge**) ban ia kiwei pat bad bunsien kine kiba thiah ki ju thiah lada bun eh ka sboh naitrojen, lane lada bun eh ka um ha ka khyndew. Khnang ban iarap ia u pai ba un ieng, ki ju tehsong kumta ba kin ia bat uwei ia uwei pat.

## **Ki Jingpang, Ki Khniang bad ki Mrad kiba Bam Pai:**

U pai, u don shibun ki nongshun kiba ialeh ban pynjot ia u kum ki khniang, ki mrad khlaw bad ki mangkariang kiba ki khot ki **fungi** kiba pynlong jingpang, bad kito kiba ki khot ki **virus**, kita ki kynja met ne jingthung kiba pynlong ki jingpang ia kiba nga la batai katto-katne shaphang jong ki ha ka lynnong kaba dei shaphang u phan.

Na ki khniang kiba kham pynjutor eh ia u pai ki dei kito ki khniang kiba ksam thliw ia u jyntang jong u pai kiba kham pynjutor eh shibun. Ki long ki kynja niangnuih (**caterpillar**) kiba mih na ki thapbalong. Kine ki thapbalong ki kha pylleng sha lyndet jong ki sla u pai. Na kine ki pylleng ki mih kitei ki niangnuih bad ha ka ba nyngkong ki bam ia ki sla, hadien pat ki ksam ia ka met u pai haduh ba ka um ha u pai kam iaid beit shuh bad hadien kata ki khniang kylla thapbalong hapdeng hynriew taiew. Kumta ki lah ban roi stet katta katta. Don ar ne lai ki rukom kiba ngi lah ban leh ban kham pynduna ia kine ki khniang. Lah ban lum ia ki pylleng (namar kawei kawei ka thapbalong ka lah ban kha kymba 400 tylli ki pylleng), lane lah ban thang da ka ding harud lyngkha. Lah ruh ban ym thung ia u pai lane ban ym iehnoh ia u pai ba un mih ar snem lai snem na u juh u tynrai. Kine ki buit ki lah ban iarap katto katne, hynrei, kin ym lah ban leh shibun eh ban pynduh ia kine ki khniang pong doh met (**stem borers**).

Uwei pat u khniang uba pynshitom eh ia u pai u dei u kruin (**white ants** lane **termites**). Lada thung ia u pai ha ka rukom kaba ki ju thung sha kiwei kiwei ki jaka jong ka pyrthei da kaba thung da ki lyngkhot pai (**sets**) kiba la ot lyngkhot lyngkhot kumba la batai haneng kata ki kruin ki ioh li bha ban pynjutor. Ki sdang na ki shylluid (**eyes**) lane na ki arliang ki tdong jong kine ki lyngkhot pai. Lada ki kruin ki pynshitom kumne ha ka por thung, kaba ki ju leh ka long ban wieh ia ki tdong jong kine ki lyngkhot pai ha ka dawai kaba la shna da kaba pynum katto-katne ka bsiang (**coal tar**) bad khleh ia ka bad ka um. Ha ki jaka ha kiba u shaba nim (**neemcake**) u tad, lah ban buh da une u shaba ha ki nur ha ka por thung. Hynrei,



kaba kham bha eh ka long ban ai um kham bunsien bad ban kynroi ia ka khyndew sharud ki pai man la ka por, namar u kruin um sngewbha ia ka um bad ka jingshai.

Na ki jingpang pai pat kiba ngi ju shem ha kane ka ri India bad ha ri Assam bad ka ri Khasi-Jaintia ruh, kaba kham longsan eh ka long ka **pang tang saw (red rot)**. La khot ia ka da kane ka kyrteng namar lada phiah arlaing ia u met pai, lah ban iohi ia ka jingthoh saw baroh shi lynter ki ksai pai (**fibres**) ka da sdang na ki mat (**nodes**) bad ka da par baroh shi lynter ka pung (**internode**) kane ka jingsaw hadien ka lah ban kylla lam byriong ne rong ktieh (**brown**). Ki dak kiba lah ban iohi na shabar pat ki long kumne: ki sla kiba kham shapdeng u met pai ki sdang ban stem bad kum ban tlor, bad tang u thied bah jong ka sla (**mid-rib**) u lah ban jyrngam. Ki riewstad ki tip ba kane ka jingpang ka long na uta u kynja mangkariang uba ki khot u **fungus** ha ka ktien phareng bad uba ki la ai kyrteng saian u **Colletotrichum fulcatum** hynrei, kim da tip bha kumno une u jingthung u roi ha u pai. Kaba kham kongsan eh, ka rukom ban ialeh pyrshah ia kane ka jingpang ka long ban ym thung da kino kino ki pai kiba don dak saw lane ban ym thung da ki pai kiba ioh na ki jaka kiba don kane ka jingpang, lane ban thung tang kito ki jaid pai ia kiba kane ka jingpang kam ju kham kem ia ki. Ha ri Khasi-Jaintia, u pai talu (**paunda** lane **noble** lane **tropical cane**) u long u jaid pai uba kham ioh ia kane ka jingpang. Hynrei, kito ki jaid pai kiba kham rit met kum kito kiba ioh mynta na Coimbatore, na ka **Sugar Cane Breeding Station** jong kane ka ri India, ki long kiba kham lah ban ialeh pyrshah ia kane ka jingpang. La kumta ruh don uwei u jaid pai na Coimbatore uba ka la ai kyrteng G.2: 3 uba shait ioh eh ia kane ka jingpang. Ia une dei ban kiar. Ha ka jylla Assam imat ki niew ia u pai Co.361 ba u long uba kham lah ban ialeh pyrshah ia ki jingpang bad wat ia ki khniang ruh. Lada kane ka jingpang ka la paw ha kano kano ka lyngkha kaba bha eh ka long ban ym shah ia u pai ha ka ta ka lyngkha ba un san haduh kawei pat ka snem.

Nalor kitei ki nongshun, ki mrad khlaw, kum ki myrsiang,

ki sniang khlaw, ki khnai bad kiwei ki long ruh kiba pynjulor ia u pai. Ia kine baroh ngi dei ban ialeh ban pynduna.

### **Ka Jingot Pai bad ka Jingpyndonkam ia u :**

U pai u shim por kumba shi snem ban ih. La kumta ruh ka shong ha u jait pai bad ha ka jingshit jingkhriat jong ka jaka. Ynda ki sla ki la sdang ban iap stai, kata ka la dei ka por ban ot ia u. Ha ki bun ki bynta jong ka ri India, ki ju ot ia u pai da ka rashi hynrei, ha ri Khasi-Jaintia ki pyndonkam da ka wait.

Haba khein lang ia ka ri India baroh kawei, ia u pai ki kham pyndonkam eh na ka bynta ban shna **gur**. Ha ka jylla Assam ruh kumjuh, kumba 98 percent u pai ki shna gur. Kan long namarkata, kaei kaei kaba bha bad kaba myntoi shibun ia u Khasi-Pnar lada un nang kumno ban shna gur. Ka gur ka long ka mithai lali (**molasses**) kaba eh bad kaba rong saw bthuh, bad kane ka pynlong ia ka, ka bym da sngewtynnad eh ban pyndonkam ha kaba dih sha. Hynrei, ha ri dkhar ki pyndonkam bah ia kane ka gur ha ka khleh bad ki kynja jingbam baroh bad ha kaba shet mithai (**sweets**) lane ha kaba shu bam kumto. Ka ri India baroh kawei ka pynmih kumba 3,000,000 ton ka gur shi snem shi snem. Ia ka gur ngi shem ha iew ha hat bad ka don lai rukom: kaba tylli kum ki maw kiba lam pyllun, lane kaba kum u pawdar kata ka ba phret, bad kaba lam long um (**semiliquid**). Ia kane ka gur (**raw sugar or jaggery**) ki shait shna ha kylleng ki nongrit jong ka ri India kumne kumba la batai harum :

Nyngkong eh ki tylliat ia u pai bad ki pynmih ia ka um pai. Ia u pai ki tylliat ha ki **roller** kiba lah ban shna da ka dieng lane da u nar. Lah ban ioh ia kine na ki kompani bapher bapher kiba shna ia kine ki jait tiar. Ki roller kiba lah ban ioh na kitei ki kompani ki lah ban tylliat kumba lai ne saw mon u pai ha ka shikynta bad ki pyniaid ia ki da ki masi dab. Na ka shispah kilo u pai ki lah ban pynmih haduh kumba 65 kilo lane 70 kilo ka um pai. Ia kane ka um pai pat ki sa shet ha ki khiew nar (iron pans) kiba heh ha ka ding kaba la shna khnang na ka bynta kane. Kane ka ding ka long bunsien tang da ka **pajwa**

(**furnace**) kaba ki tih hapoh khyndew bad kaba don u kynja atoskhana ha kawei ka dong bad ka thliew ban sei ia u dpei na kawei pat ka dong. Ha bun ki jaka kim ju pyndonkam dieng iap ei ei lait tang da u shaba pai (**bagasse**) uba sah na u pai ynda la khnoit noh ia ka um pai. Ki khiew nar pat kiba ki ju pyndonkam ki long kiba heh bad kiba lah ban shet kumba 120 kilo ei ei. Hynrei, kine ki khiew ki iapher na kawei ka jaka sha kawei pat. Don ki khiew kiba lah ban shet tang kumba 25 kilo ka um bad don pat kiba lah ban shet haduh 600 kilo ka um pai. Ha ki katto katne ki jaka pat ki buh ia kine ki khiew kumba san ne hynriew tylli shisien shet ha ka pajwa kaba jrong lynter. Shuwa ban shet ia ka um pai ki ju da jiar ia ka namar ba kan kham khuid ka gur. Nalor kaba leh kumne ki ju pyndonkam katto katne kiwei pat ki jingpynkhuid kum ka um kaba mih na ka snep jong u bhindi (**lady's finger**), lane ka shun, lane ka kynja dawai kaba ki khot **sodium hydrosulphite**, lane u rnga jong u skop kba, lane da ka julab (**castor oil**) bad kiwei kiwei. Ia kine ki juhuh ha ka um pai katba ka nang thnam ha ding. Da kaba leh kumne ka jakhlia bad ka sboh ka sbiar, ka kiew hajrong bad ki sa khat noh ia ka da ka siang kaba pei thliew (**perforated ladle**), kumta ba ka um pat kan ym lehnohei. Ha ki katto katne ki jaka kim ju pyndonkam jingpynkhuid (**clarifier**) ei ei, hynrei, ka gur kaba ki ioh na kaba khlem pynkhuid ka don ka rong kaba jngut bad ka bym da stem itynnad. Kaba donkam eh ban nang ha kaba shet ia kane ka um pai ka long ban ithuh ha kano ka por ne ka kyrdan (**stage**) dei ban rah noh ia ka nar na ding lane ban tong noh ia ka um pai ban pynkhriat ba kan lang. Kane ka long kaba donkam ban ithuh. Lada ym ithuh ia kane ka gur ka lah ban ym long. Lada rah noh kham shuwa ia ka por kaba dei kata ka lah ban shu lang um ha kaba ki ju shna shini. Ia kane ka syrup ki khot ha ka ktien Hindustani **rab**. Hynrei, lada rah kham hadien ia kane haba ka temperature ka long kumba 10° C bad 11° C ka pynlong ka gur kaba kham jem. Lada rah pat kham hadien khyndiat ia kane ki ioh ka gur kaba kham eh. Lada shet kham palat pat ia kine ka pynlong ka gur kaba long powder, syriem ia ka shini tangba ka saw bthuh. Na ka shispah kilo u pai lah

ban ioh kumba 10 kilo ka gur. Kiba kwah ban ioh jingtip shuh shuh shaphang kaba shna gur lane shaphang kaba shna shini na u pai ki lah ban tohkit kham bha na ka **Indian Institute of Sugar Technology, Kanpur, Uttar Pradesh.**

Shaphang kaba shna shini na u pai ngi lah ban shu ong lyngkot ba nador ki karkhana kiba rit kiba don kylleng ka ri India don mynta kumba 150 tylli ki karkhana heh kiba shna shini. Ia ka shini ki shna ruh ha kylleng ki nongkyndong ha ka jylla Uttar Pradesh bad kiwei kiwei ki jylla, kiba rep bun u pai, ha India, kumba nga la pyni haneng na ka um pai, kaba ki la shet, kaba ki khot ha ka ktien Hindustani rab. Kane ka long kum ka syrup ne ka um shini kaba ki ioh kumba la pyni haneng na kaba shet ia ka um pai bad hadien kata ki sa buh ia ka ha ki khiew ne ki tin haduh kumba ar taiew ei ei. Ha kine ki taiew ka rab ka sdang ban pynmih ia ki symboh shini (**crystalize**). Ia kane ki shim bad ki theh ha ka kor kaba jiar ia ka mithai lali (**molasses**) da kaba pyntyllun (**revolve**) stet ia ka kor. Ia kane ka kor lah ban pyniaid da ki ar ngut ki briew lane da ka enjin (engine). Ynda la jiar noh ia ka mithai lali, ka sah sa ka shini ha kane ka kor. Ia kane ka shini ki sa thad ha ka sngi khnang ba kan duh ka rong saw kaba dang sah katto katne ha ka shini. Kino-kino kiba kwah ban thied ia kane ka kor ban jiar (**centrifuge**) ki lah ban tohkit na katei ka Kolej kaba ngi ia ai kyrteng haneng: Indian Institute of Technology, Kanpur. Na ka shispah kilo u pai lah ban ioh kumba 8 kilo ka shini.

Ia ka shini lah ruh ban shna na ka gur da kaba pynum biang ia ka gur bad hadien kata sa jiar ha katei ka kor (centrifuge). Kane ka rukom shna shini na ka gur kam long kaba ki ju kham leh, bad ka donkam katto katne ka jingnang kaba kham thikna.

## LYNNONG 13

### U DUMASLA

U dumasla u long u jingthung uba u nongrep ha ri Khasi-Jaintia u lah ban ioh jingmyntoi shibun eh. Nga ngeit ba ka jaka ruh ka long kaba iadei eh na ka bynta une u jingthung. Kaba donkam ia u nongrep ha ri Khasi-Jaintia ban tip ka long kumno ban shna dumasla na une u jingthung. La katta ruh ngan thoh katto katne shaphang une u jingthung shuwa ba ngan batai ia ka rukom shna dumasla na ki sla jong u.

U dumasla u long u jingthung uba la wanrah sha kane ka ri India na ka ri America. Shwa ban shem ia ka ri America ki brieve kim ju tip ia ka dih duma lane dih sikret ne dih shrut. Hynrei, hapteng khyndiat spah snem ka jingdih sikret ne dih duma ka la phriang kylleng ka pyrthei bad mynta u dumasla u la long uwei na ki jingthung uba kongsan tam jong ka pyrthei. Ka India ka pynmih kumba 580000 ton u dumasla shisnem shisnem bad ka wan ba saw hadien ka USA, Turkey bad Greece ha ka jingpynmih ia u dumasla. Ka ri India ka chalan, ym duna ia ka 85000 ton u dumasla shabar ri. Na kane ngi lah ban iohi ba ka ri India ka long kawei na ki ri kiba rep bha ia u dumasla, bad u long ruh ha man la ki jaka ha ka ri India. Ka jingpynmih dumasla ha ri India ka long kumne: Andhra Pradesh (2.54 lak ton), Gujarat (1.5 lak ton), Uttar Pradesh (.72 lak ton) , Bihar (.09 lak ton) , Tamil Nadu (.09 lak ton), West Bengal (.13 lak ton), Karnataka (.44 lak ton). Kumta na ki jylla jong ka ri India baroh ka Meghalaya ka long kaba duna shibun ha ka jingpynmih dumasla. Kane kam dei namar ba ka jylla Meghalaya ka long ka jaka ka bym bit ia ka ban rep ia une u jingthung, hynrei namar ba ka jylla kam pat nang kumba nang kiwei pat ki jylla ha ri India ia ka ban shna duma na ka sla jong une u jingthung. Kane ka long kaba shisha khamtam ia ka ri Khasi-Jaintia jong ngi.

Don ar jaid ki jaid dumasla ba ki thung na ka bynta ba ki

pyndonkam ha kaba dih duma bad dih sikret bad kiwei ki jingdonkam. U jaid uba ngi shait kham shem eh ha Bengal bad ha ki jaka kiba kham shatei jong ka ri India u long uba ki la jer ha ka kyrteeng saian (**scientific name**) u *Nicotiana rustica*. Une u jaid u don u syntiew uba jyrngam stem. U long ruh uba khain bad uba mih khah ki sla. Uwei pat u jaid dumasla uba ki khot *Nicotiana tobaccum* bad uba ki ju kham thung ha ki jaka kiba shaphang shathie jong ka ri India u don ki syntiew kiba lam byrsaw (**pink**), bad uba kham jrong ka ryenieng. Ki sla ruh ki kham nep bad kham stang ban ia ki jong utei uba nyngkong. Ia ka sla jong u *Nicotiana rustica* ki shait pyndonkam ha kaba shna duma dih, lane duma bam (**chewing tobacco**) lane ha kaba shna duma ban iw (**snuff**). Ia ka sla jong u *Nicotiana tobaccum* pat ki ju pyndonkam ban shna sikret, lane cigar, lane u shrut, lane biri, lane na ka bynta ban shna duma dih bad kiwei kiwei pat ki jingpyndonkam.

La u dumasla u long ha kylleng ki jaka jong kane ka ri India hynrei, u long kham bha ha ki jaka dew kynroi (**open soils**) ha kiba ki thied jong une u jingthung u lah ban ngam jylliew. Kam da donkam eh ba ki khyndew kin da sboh eh namar lada bun eh ka naitrojen ka sla ka kham rben bad namarkata kam long kaba da bha eh, khamtam na ka bynta u dumasla uba ki shna sikret. Na ki khyndew kiba kham sboh, lah ban thung tang ia u dumasla na uba mut ban shna duma dih. Ki khyndew kiba don shibun ka potash, ka phosphorus bad ka nar ki long kiba bit eh na ka bynta u dumasla.

Ki symbai dumasla ki long kiba rit katta katta namar kata dei ban da sara, shuwa ba kin thung ha lyngkha. Ki jaka sara ki dei ban long ha ka dewkynroi (**well-drained and friable soil**) bad kiba lait na ki kynja nuit baroh. Namar ba ki symbai ki long kiba rit eh, ki ju khleh ia ki bad ka khyndew lane bad u dpei shuwa ban bet ia ki khnang ba ki symbai kin ym lang eh tang shi jaka. Kane ka jaka sara ka dei ban long kaba sngem, hynrei, kam dei ban long kaba ktieh. Khnang ban iada ia kane ka jaka sara na u slap kyrthep, donkam ban da tap ia ka da ka jingsop kdait ne sder kaba niar. Ia kane ka jingsop, ka bha ban

pynkynriah mynsngi khnang ba ki sara (**seedlings**) kin ioh sngi. Kane ka pynkhlain ia ki bad ka pyllait shibun na ki katto katne ki jingpang kiba ju kem haba ki dang rit. Lada ki ia khapngiah eh ruh, donkam ban pynkynriah jaka noh katto katne khnang ba kiba dang sah kin kham khlain.

Ynda kine ki jingthung ki la speh ki sa pynkynriah ia ki sha lyngkha. Ki ju thung ia ki jngai kumba ar phut shiteng na uwei ha uwei pat u jingthung. Tang shu lah thung ia ki, dei ban ai um, lynda kumta ki lah ban iap. Ynda la thung ia ki ha lyngkha, ym da donkam eh shibun ka jingsumar lait tang ban thiew ia ki nuit lane ban shu kynroi ia ka khyndew. Khnang ban ioh u dumasla uba bha, ki ju dkhat noh da kaba shu shyit ia ki kliar jongu, kata ia u shylluit na uba u phuh (**inflorescence**) bad une un sa mih pat hadien. Da kaba leh kumne ka jingbam kaba dei ban leit sha ki syntiew ka leit sha ki sla. Ia kaba shyit (**topping**) kumne, ki ju leh kham dier ia u dumasla sikret, namar kaba shyit ka kham pynbren ia ki sla. Khyndiat sngi hadien kaba shyit ki ju mih shibun ki tnad lung (**suckers**). Ia kine ruh dei ban pynkhuid noh na ka met jong u dieng dumasla da kaba shu shyit, lynda kumta ka jingbam jong u jingthung dumasla kaba dei ban leit sha ki sla ka leit noh sha kine ki tnat.

Ynda ki sla ki la sdang ban stem kata ka la dei ka por ban kheit noh ia ki lane ban ot noh ia u dumasla baroh uwei. Khnang ban ioh ka sla kiba itynnad ki ju kheit ia ki sla kumba arsien ne laisien. Hynrei, lada shu ot shisien ot ia baroh uwei u jingthung kata ka sla kan ym long kaba da bha eh, bad kam long ruh kaba bit ban shna sikret. Lada kheit arsien ne lai sien ki ju kheit nyngkong ia ki sla kiba na kjat jong u dieng. Kine ki long ki sla kiba lah ban pynmih ia u dumasla u bym da bha eh. Hadien kata ki sa kheit ia ki sla kiba na pdeng, bad khadduh eh, ia kiba na kham na kliar.

U dumasla u don katto katne ki nongshun ha lyngkha. Kaba kham kongsan eh ka long ka jingpang kaba ia syriem ia ka jingpang kaba ngi shem ha u phan bad kaba nga la khot ka jingpang pynraid. Kane ka jingpang jong u dumasla ka long na ki met ne ki jingthaw kiba rit shibun eh kiba ngi lah ban iohi

tang da ka electron microscope bad kiba ki khot ha ka ktien phareng ki **virus**. Kane ka jingpang ka long kaba iabit shibun. Ki ong ba ha ri America kim ju shah ia kiba dih sikret ne dih shrut ban trei ha ki lyngkha dumasla namar ba u sikret lane u shrut uba ki dih u lah ban don kum kata ka jingpang, bad lada ktah ia uta u sikret lane u shrut bad hadien kata pat ka ktah ia u dumasla ha lyngkha, uta u dumasla ha lyngkha ruh u lah ban ioh ia kane ka jingpang. Kane ka jingpang ka pynmih ka rong kaba stem pateng pateng ha ka sla kaba jyrngam, bad ki sla ruh ki dor kdiah (**crumple**) bad u jingthung baroh uwei u thain bad um jrong kum u jingthung uba koit ba khiah. Wat ki khniang ruh ki lah ban pyniabit jingpang ia uwei jingthung na uwei pat da kaba kjit ia ka um jong kawei ka sla, hadien kata pat ki leit dem ha kawei ka sla jong uwei pat u jingthung. Kaba bha tam eh ban ialeh ban pynduh ia kane ka jingpang ka long ban phut lut ia ki jingthung kiba pang kumne. Ngan shu ong hangne ba lada don kano kano ka jingpang ha u dumasla lane ha uno uno u jingthung uba ki nongrep ki bym sngewthuh kumno ban leh khnang ban pynduh ia kata ka jingpang, kaba bha eh ka long ban thoh sha u Director of Agriculture jong ka Meghalaya uba don ha Shillong lane ki lah ban kylli na Agricultural/Hotricultural Extension Officer kiba trei ha ki thain jong ki lane ki nongrep ki lah ban thoh sha ka Assam Agricultural Unversity, Jorhat lane sha ka ICAR Complex ha Khwan.

Don ruh katto katne ki khniang kiba sam thliew ia u dieng jong u jingthung dumasla, bad kiwei pat kiba bam ia ki sla. Hynrei, ngam ngeit ba ka jingpynjulor ka long kaba da jur katta ba yn donkam ia u nongrep ha ri Khasi-Jaintia ban leh ei ei.

Ynda la kheit ia u dumasla lane ot ia u nga ngeit ba kaba donkam eh ha ri Khasi-Jaintia ka long kumno ban sumar lane ban shna ia u khnang ba u lah ban long ka mar ka mata kaba lah ban die ha iew ha hat. Namar kata ngan pyni ia ki katto katne ki rukom kiba ki pyndonkam kat kum ki jaka jong kane ka ri bad ha kiwei pat ki ri jong ka pyrthei ruh, ban pynlong ia u sla duma uba bha na ka bynta ban shna sikret lane shna shrut lane ban shna dumasla.



Ka rukom kaba jem eh bad kaba ki ju kham leh ha ki nongkyndong ka long ban shna (**cure**) ia ki sla da kaba shu thad man ka sngi ha madan. Ia kane ka rukom ki khot **ground curing**. Ki shim ia ki sla bad ki thad ia ki ha khyndew ha madan man la ka step, bad ki sa rah noh sha ing man ka jan miet. Hapoh iing pat ki kynton lang ia ki. Ki leh kumne haduh ba u thied pdeng (**midrib**) jong ka sla u la rkhiang.

Ha Bengal, ha ka jaka ban shu thad ha madan ki thad halor ka shylliah hadien kata ki sa khum kumba 8 haduh 12 sla shi song. Ia kine ki khum ki sa sdien ha ki shken hapoh ka sem (**shed**) haduh ba kin da rkhiang bha nangta pat ki sa lum lang ia ki shi jaka hapoh iing.

Kawei pat ka rukom kaba ki ju leh ban shna ia ki sla dumasla ka long kaba ki khot ka **rack curing method**. Kane ka long ka rukom kaba ki ju kham pyndonkam ban leh ha Andhra Pradesh bad ha Bengal. Ha Bengal ki ju leh kumne, ia ki sla kiba ki dang shu lah kheit ki rah ha ki shang sha iing bad nangta ki sa the song ia ki ha ki song kiba don kumba 4 haduh 6 tylli ki sla shisong. Ha kawei pat ka step ia kine ki song ki sdien ha ki skhen bad ki thad ia ki ha ka sngi kumba 4 haduh 6 sngi, hadien kata ki sa song ia ki bad ki sa teh biang, da kaba kham pyniadait ia ki. Nangta pat ki sa thad ia ki kumba ar sngi ne lai sngi bad ki sa rah ia ki sha ka sem kaba ki da shna khnang na ka bynta ban buh ia ki da kaba wah ia ki ha ki shken. Ia ki sla la ieh kumne haduh kumba shi bnai ne haduh ba kan da sdang slap, kata ba ki sla kin ioh jingsngem bad ba kin ym shroin eh. Hadien kata pat ki sa weng noh ia ki na ki shken, bad ki sa kynton syrtap-syrtap ia ki.

Kaba lai pat ka rukom ka long kaba ki pyndonkam na ka bynta u dumasla uba kham bha. Ia kane ka rukom kaba ngin sa batai harum ki khot **flue curing method**. Kane ka long ka rukom kaba ki ju pyndonkam sha America bad kiwei kiwei pat ki ri. Ia kane ka rukom la sdang ruh ban pyndonkam hangne ha ri India la katto katne snem mynta. Ka jaka ha kane ka ri India kaba ki pyndonkam nyngkong ia kane ka rukom bad ha kaba haduh mynta ki kham leh bha eh ka long ha ka distrik

Guntur kaba don ha Andhra Pradesh. Dei kane ka distrik kaba pynmih u dumasla uba bha tam ha ri India na ka bynta ban shna sikret. Ka **India Leaf Tobacco Development Company** ha Guntur District ka long ka kompani kaba heh shibun eh, bad kaba thied lajan baroh ia u dumasla uba ki shna ha kane ka distrik khang ban shna sikret.

Khnang ban shna ia ka sla da kane ka rukom, donkam ka iing ne sem (**barn**) kaba thikna. Lada ka lyngkha ka long kumba 15 ekar ka jingheh jong ka sem ka long kumba 16 ft x 16 ft x 18 ft hynrei, lada ka lyngkha ka long kumba 20 ekar, kata ka sem ka dei ban long 20 ft x 20 ftx 22 ft. Ka kynroh jong kane ka sem ka dei ban long da u mawit lane da ki maw bad ia ka jingsop jong ka, lah ban leh da ka tin, hynrei, kaba kham bha ka long da u mawit khnang ba ka jingshit jingkhriat hapoh ka sem kan ym kylla kloie eh. Kane ka sem ka dei ban don ka lynti iaid lyer ha ki tnum bad ka dei ban long kaba lah ban plie lane khang ia ka katba mon. Nalor kata ka dei ban don ruh ar ne lai ki thliw (**ventilation**) hajan kjat jong kawei ne ar ki kynroh. Kine ki thliw ruh ki dei ban long kiba lah ban plie lane set katba mon khnang ba ka lyer ka lah ban rung tang haba donkam. Haba plie ia kine ki thliw bad ia kitei ki thliw na tnum, kata ka lyer ka lah ban iaid lyngba kane ka sem. Kane ka sem ka don ruh ka pajwa kaba ka khlieh jong ka, ka ia ryngkat bad ka tbian (floor) jong ka sem. Ia ka lyer shit na kane ka pajwa ki ialam da ki paip (pipe) nar kiba 12 inshi u diameter, bad ka ba par baroh sawdong ka sem bad kaba kut khadduh khadwai, kum u atoskhana ha ka tnum hamar pyrshah jong ka pajwa. Ha kawei na ki saw tylli ki kynroh jong kane ka sem, don iwei i jingkhangiit iba rit iba ki pyndonkam ban peit ia ki **thermometer** (jingthew ia ka jingshit jingkhriat ka lyer).

Ynda la sdien ia ki sla bad la buh ia ki hapoh kane ka sem, ia ki jingkhang bad ki ventilator baroh ki sa khang noh, bad ki sa ai ding ia ka pajwa. Dei ban ai ding suki suki ba ka jingshit kan ym kiew kynsan eh. Donkam ruh ban da thew ia ka jingshit kaba hapoh iing, la ka jingshit ki thew da ki thermometer kiba ki buh ha pyrshah i jingkhangiit iba rit iba long kumba 4 phut

shiteng na ka khyndew bad i bymdei ban plie katba ki nang pynrkhiang ia ki sla hapoh ka sem. Ka jingshna ia ki sla dumasla da kane ka rukom ka long kumne: (1) kaba pynstem ia ka sla (2) kaba pynneh ia ka rong (3) kaba pynrkhiang ia ka sla. Khnang ban pynstem ia ka sla, ka jingshit jong ka sem ka dei ban long naduh kumba 85 degree (Fahrenheit) haduh 100 degree (Fahrenheit), bad ka dei ban neh ha kane ka jingshit naduh kumba 30 haduh 40 kynta. Hadien kane ki plie ia ki ventilator malu mala ban pynmih ia ka jingsngem. Nangta pat ki pynkiew ia ki jingshit khnang ban pynrkhiang ia ka sla na ka 120 haduh 165 degree, bad katba ki nang pynkiew ia ka jingshit katta ki nang pynrit iaka jingplie jong ki ventilator. Kane ka jingpynrkhiang ka neh kumba 28 haduh 42 kynta. Ynda ki sla ki la rkhiang bha haduh u thied pdeng (midrib), ki sa pynduna ia ka ding bad sa plie ia ki ventilator baroh, khnang ban rkhiang ka sem. Ki sa leh kumne baroh shi miet bad ia ka jingkhang ruh ki iehnoh rynghang khnang ba ki sla kin ym shroin eh ynda haba la dei ban shim noh ia ki na sem mynstep. /

Ka sem kaba heh kattei katba la ong haneng kata 16 ft x 16 ft x 18 ft, ka lah ban ngiam kumba shi ton u dumasla, bad une ynda la dep shna, un long kumba 200 kilo. Ynda la sei ia u na ka sem ki sa jied bad buh kyrpang ia ki sla kat kum ka jingitynnad jong ki.

## LYNNONG 14

### U KEW BAD U BARLI

U Kew bad u Barli ki long ki jingthung kiba la wallam dang shen sha ri Khasi-Jaintia. Kine kim lah ban long bha ha ri Khasi-Jaintia kumba ki long sha kiwei kiwei ki ri jong ka pyrthei, lane kum ha kiwei pat ki bynta jong ka ri India, kum ha Punjab bad Uttar Pradesh. La katta ruh namar ba don kiba kwah ban ioh jingtip shaphang kine ki jingthung, ngan shu thoh lyngkot shaphang jong ki.

U kew u long uwei na ki jingthung kiba donkam tam ha ka pyrthei. Ha ki ri ha kiba kim thung kba, une u long u jingbam uba kongsan bad u ba shim pli ia ka jaka u khaw. Ki ri kiba kham rep shibun eh u kew ki long ka United States of America, ka Russia, ka Canada bad ka ri India jong ngi. Ha kane ka ri India, kumba nga la pyni haneng, ka jingrep kew ka long ha kito ki jaka ha kiba u kba um da long bha. U kew u donkam ka jaka kaba khriat bad u slap ruh u dei ban kham duna shibun ban ia kaba ngi ioh ha ri Khasi-Jaintia. Ka jingsngem jong ka lyer ruh ka dei ban kham duna shibun ban ia kaba ka long ha ri Khasi-Jaintia. Kumta hangne ha ri India ki ju thung kew kham bun ha Punjab bad Uttar Pradesh ha ka por tlang. U kew uba ki thung ha kine ki jaka ruh um lah ban shah ia u thah, hynrei don katto katne ki jaid kew kiba ki thung ha ka por tlang ruh ha ki jaka kiba don thah kum ha Canada, Russia, America, Nepal bad kiwei kiwei ki ri khriat.

U kew u long u jaid phlang, bad u iasyriem ia u kba. Hynrei, u soh jong u, um long u rynjub (**panicle**) kumba ngi shem ha u kba, hynrei u long u lngong (**spike**). Na uwei u jingthung kew ki lah ban mih shibun ki lngong san ne hynriew ne paiat ruh, kat kum ka jinglong jong u hi, ne ka jinglong ka khyndew, na ka jaka ha kaba u mih. Une u jingthung u iasyriem eh ia u barli, tang ki lngong ha u barli ki long bunsien kiba don ki

tmain kiba jrong. U stait uba sop ia u symboh barli ruh **bunsien** um iakhlad na u symboh wat ynda la shoh kumba shoh kba ha lyngkha. Ia u nongrep uba ju rep ia kine ki jingthung ym don jingshitom ei ei ban ithuh ia ki, na ki rong jong ka sla, na ki jingheh jingrit jong ka sla, na ka rukom long jong ki bad kiwei kiwei ki jinglong kiba iapher jong ki.

Ha ka pyrthei bad hangne ha ri India ruh don bun jaid (**species**) ki kew, hynrei don ar jaid kiba ki kham thung eh hangne ha ri India, uwei uba ki ong ha ka ktien phareng **common bread wheat**, bad uwei pat uba ki ong **durum** lane u **macaroni wheat**. Ha pdeng kine pat ruh don bun jait (**variety**), ba ka long kaba donkam ban da pyrshang bun snem shuwa ba ngi lah ban ong uba kumno u jait (**variety**) uba lah ban iadei bha bad kano kano ka jaka. Lada ngi lah ban shem u jait kew uba iadei bad ki ri lum jongngi, nga ngeit ba ka jingrep ia une u jingthung kan roi ha ki lum Khasi-Jaintia. U kew uba ngi ioh na Balipara imat un iadei bad katto katne ki jaka ha ri Khasi- Jaintia.

Ha ka por ba thung ia u, ka bneng kam dei ban shit ieh lane khriat, hynrei ka khyndew ka dei ban don ka jingsngem kaba biang khnang ba un speh (**germinate**) u symbai. Ynda u la mih pat, ka khyndew ka dei ban shu sngem malu mala bad ka bneng ka dei ban long bunsien kaba rkhiang. Shuwa ba un ih, ka bneng ka dei ban long kaba shit bad kan rkhiang. Ha ki bun ki jaka bad ha ri lum Khasi- Jaintia ngi lah ban thung tang shu sdang u January bad ban ot ia u ha u bnai May. Ha ki katto katne ki jaka, ngi lah ban thung ha u bnai August bad ban ot pat ha u bnai December. Um lah ban long ha ka por slap bad um lah ruh ban long ha ka tlang bah, lynda ngi ioh ia ki jaid kew (**winter wheats**) kiba lah ban shah ia u thah kum utei na Balipara. Ka khyndew kaba ki ju kham thung ia u ka long ka bym da dait eh bad kaba lah ban bat ia ka um bad kaba sei soh bha.

Ia ka lyngkha ha kaba kin thung kew, dei ban da lur bha bad ban da thiew lut ia ki niut ki nier baroh, ha ri dkhar ki ju lur haba dei badei haduh kumba 12 sien ne palat ruh. Ia u

symbai lah ban shu thung shat (**broadcast**) lane lah ban thung kumba ki ju leh sha ri dkhar ha i nur iba la ruid da ka lyngkor **desi**. Lada shu bet shat, kata dei ban da kynroi bha ia ka lyngkha da ka kor kaba ki khot ha ka ktien phareng ka **harrow** ka kor kaba ia syriem ia u proh (**fork**). Ki ju thung kumba 100-125 kilo ha ka shi hektar ia u jait sonalika bad 75-100 kilo shi hektar ia u jait kalyan sona ki jait kew ki ba kham rep bha ha ri India. Ka jingmih pat ka long kumba 8000 kilo na ka shi hektar. U kew u shim por kumba saw bnai ban ih.

Ha ki jaka ha kiba ka bneng ka shit sngem, u kew u shait ioh eh ia ka jingpang kaba ki khot ha ka ktien phareng **rust** (**ka sarang nar**). Hynrei, don mynta ha ri India ki jaid kew kiba kane ka jingpang sarang kam lah ban pynjulong eh shibun. Kane ka jingpang ka long na ki kynja makariang kiba ki khot ha ka ktien phareng fungi bad kiba pynjulong ia ki sla lane ia ki jyntang kew. La khot ia ka ka pang sarang namar, kane ka mangkariang ka pynmih u pawdar uba kum ka sarang nar, uba sop ia ka sla, ia u jyntang bad kiwei pat ki bynta jong u jingthung.

U symboh kew, ynda tylliat, u pynmih u ata ne moida na uba ki Dkhar ki shet chapati. Na u moida ki shna ruti, biskit, u cake bad kiwei kiwei ki jingbam. Na u ata bad moida jong utei u kew uba nga la batai haneng uba ki khot u durum ki ju shna suji lane sewai (**vermicelli**) lane **macaroni**, Une uba khadduh u long u jingbam uba ki shait bam bha ki nong Italy bad kiwei ki nong sepngi.

U barli ruh u long u jingthung uba syriem ia u kew ha kiei kiei baroh, hynrei, uba kim da niewkor eh kum ia u kew. Ka rukom thung ia u ka long syriem ia u kew, tangba une u lah ban long wat ha ki jaka ha kiba u kew um da long bha. Ha kane ka ri India, ka jylla Uttar Pradesh ka long ka jaka ha kaba ki thung bha eh ia u. Ha ri sepngi, ka Germany, ka United States of America bad kiwei kiwei ki ri ki thung bha ia u. Ha Germany ki kham pyndonkam ia une na ka bynta ban shna ia kata ka kiad kaba ki khot ka (**beer**). Nga ngeit ba une un

kham long bha ban ia u kew ha ki bun ki jaka ha ri Khasi-Jaintia.

Uwei u barli uba la wallam na Balipara dang shen, u long uba lah ban kham iadei ha ri Khasi. Une u barli Balipara u long uwei u jaid uba ki khot ha ka ktien phareng **naked** namar u skop jong u symboh um da bat skhem ia u symboh kumba leh kiwei kiwei pat ki barli, La khot ruh ia u namarkata **hull less**. U symboh namarkata, u iasyriem ia u kew, ia une u barli ruh dei ban thung ha ka juh ka por ba thung ia utei u kew tlang (**winter wheat**) na Balipara.

## LYNNONG 15

### KI KRAI, U SOHRIEW BAD KI DAI

Ha kane ka lynnong ngan shu thoh kyllum ia kito kiwei ki jingthung lum (**field crops**) kiba ngi shem ha ri Khasi- Jaintia hynrei, kiba ym da long kiba donkam kum kitei kiwei kiba nga la thoh ha ki lynnong kiba mynshuwa. Ki jingthung kiba nga kwah ban thoh ha kane ka lynnong ki long ki krai, u sohriew bad ki dai.

#### Ki Krai :

Don bun jaid eh ki krai ha ka pyrthei bad don ruh bun jaid ha kane ka ri India. Ka ri Khasi-Jaintia ruh ka don katto katne ki krai kiba ki nongrep ki ju thung, bad ki long kine : U 'rai-truh (***Eleusine coracana***) uba ki khot ruh ha ka ktien phareng **finger millet**, u 'rai-soh (***Setaria italica***) uba ju khot ruh ha ka ktien phareng **fox tail millet** lane **Italian millet**, u 'raishan (***Panicum millaceum***) uba ki khot ha ka ktien phareng **broom corn** lane **common millet**.

Shuwa ba ngan batai shaphang kine ki krai kiba ki ju thung ha ri Khasi-Jaintia, ngam banse ban ong ei ei ia kitei ki kyrteng kiba jrong kiba da ki dak Italics. Ki jingthung baroh ha ka pyrthei ki don la ki jong ki kyrteng saians. Ia kine ki kyrteng la jer nyngkong da u riewstad uba batai nyngkong ia uta u jingthung. Ka kyrteng kaba ki jer ka long barabor ha ka Latin bad kane ka long ka kyrteng kaba ki tip ha kylleng ka pyrthei baroh kawei. Nga la pyrshang ban kiar na kaba ai ia kine ki kyrteng kiba jrong namar ngam kwah ba kan ialam jingmut noh ia u nongrep na kiba nga kwah ia u ban tip, kata kumno ban pynroi ia la ka jingrep, hynrei ngam banse ban ai da kitei ki kyrteng kiba thikna, namar lah ban don kiba kwah ban tip ngi kren shaphang uno u jaid jingthung. Ka kyrteng phareng bunsien kam biang, namar ba, wat ha ka ktien phareng haba dei badei ki khot da ki bun ki kyrteng ha la ki jaka jaka. Kata wat la ki kren da ka ktien phareng



ha America, lane na South Africa, lane ha Australia, lane ha Bilat hi, hynrei ki lah ban ai la ki jong ki kyrteng. Hynrei, kitei ki kyrteng saians ki long kiba baroh kawei ka pyrthei ka tip, naduh u China haduh u Japan, u German ne uno uno u jaid bynriew. Don ruh kumba ki nongpule ki lah ban iohi hangtei haneng, ki jingthung ki bym don kyrteng ha ka ktien phareng namar ba, uta u jingthung um don ha Bilat, lane ki nong Bilat kim pat jer kyrteng ia u ha ka ktieng jong ki.

U 'raitruh (*Eleusine coracana*) u long u krai uba kham kynrei eh ha kane ka ri India. Ki kham thung bha eh ia u ha Karnataka, Tamil Nadu, Andhra Pradesh, Orrisa, Bihar, Gujarat, Maharastra bad Uttar Pradesh ha kaba ki khot ia u, u **ragi**. Ki ju thung ruh shibun ia u ha ki ri lum jong ka jylla Uttar Pradesh ha kaba ki khot ia u, u **marua**. Une u jingthung u long ha ki jaka ha kiba ka khyndew kam da long eh kaba sboh, kum ha ki khyndew maw; hynrei, lada thung ia u ha ki jaka sboh u lah ban mih kham bun. Na ki krai baroh kiba don ha ri Khasi-Jaintia une u long uwei uba ki kham rep bha. Ia une u krai lah ruh ban thung na ki sara. Lada thung sumar ia u, u lah ban pynmih haduh kumba shi hajar haduh khatsan spah kilo na ka shi hektar, hynrei, ha ki bun ki jaka khyndew maw u lah ban pynmih tang kumba shiteng ia kata. Ha ki por 'nemsniew une u long uwei na ki jingbam uba bit eh ban rep namar ki khniang kim ju kham bam ia une lada buh slem ia u, kumta ba lah ban buh ia u da ki bun snem. U long ruh kum ki wei ki krai uba lah ban ioh soh klo, namar ka shim por tang-kumba lai ne saw bnai ia une u jingthung naduh ka por ba thung ia u haduh ka por ban ot ia u. Une u krai u long uba kham eh ban tylliat ha ka kpoh, hynrei u long u jingbam uba bha namar u don shibun ka kalsiom kata ka met tynrai kaba long shibynta na ka shun, bad u don ruh shibun ka **carotene** (kynnoh karotin). U don shibun ka bitamin A, bad u don ruh ka bitamin B. Kine ki bitamin ki long ki kynja met kiba donkam eh na ka bynta ka jingkoit jingkhiah u briew. Ha Punjab bad ha ka jylla Uttar Pradesh ki ju shna ata na u symboh jong une u krai bad ki sa shet chapati ia u kumba ki leh ia u 'ata kew. Don ruh kiba shet kiad na une u krai. Ia ka jyndem kaba ioh na kaba shet kiad ki

ai sniang lane masi. U jyntang na u met jong u ruh u long uba ki ju ai masi.

U 'raisoh (*Setaria italica*) u long, kumba nga la ong haneng uba ki khot ha ka ktien phareng **fox tail** lane **Italian millet**. Ha ka ktien Hindustani ki khot ia une u **kukun**. Une u long u jingthung uba la thung da ki bun hajar snem ha kane ka ri India bad ha ri China ruh. U raisoh u long u jingbam uba bha shibun ban shna kpu lane ban shet **porridge** (ki kynja jingbam kaba ki phareng ki ju bam mynstep bad kaba ki shu shet thai um bad sa khleh shini bad dud ia u). Ki ong ba kaba bam ia une u krai ka pynshit ia ka met. Don ar jaid ki symboh: uwei uba lieh stem (**straw yellow**), bad uwei pat uba stem lam saw (**reddish yellow**). I une u krai ki kham thung ha ki khyndew kiba kham seisoh harud nong. Une u krai u long uba ring pah bha ia ki sim. Ha Maharashtra ia une u krai ki thung haba dei badei khnang ban bsa ia ki jingri; haba ki leh kumta ki lah ban ioh kumba 40 kwintal shi hektar. Lada thung na ka bynta ka jingbam masi, kata dei ban thung kumba 16 kilo shi hektar u symbai hynrei lada thung na ka bynta u symboh, kata tang 8 kilo u symbai shi hektar la biang. Une u jingthung ruh u long uba mih kloï katta katta.

U 'raishan (*Panicum miliaceum*) u long uwei pat u krai uba don ha ri Khasi-Jaintia. Une u krai u don u rynjub syntiew (**inflorescence**) uba iasyriem ia u kba, tang ba ki symboh jong u ki long kiba rit bha kum ki jong kitei ki krai ba la thoh haneng. Ki phareng ki khot ia u u **broom corn millet**, kata u krai synsar, namar u rynjub syntiew u long syriem ia u synsar lane ia u rynjub syntiew jong u lynnai lane u kdait. Une u krai u lah ban long wat ha ka khyndew kaba duna shikatdei ka sboh. Ha ri Khasi mynta u kham long sha ri lum (5000-6000 ft.) Une u krai u kham shim por duna ban long ban ia kitei kiwei pat ki krai. U stait uba sop ia u symboh jong une u krai, um long ruh uba shitom ban weng kum u jong u 'raitruh. Ynda u la ih ki shu synrud ia u skop uba don bad u symboh bad hadien katto katne sngi ki sa pyniakhlad ia u symboh na u stait. Une u krai ruh u long uba ki sim ki iei eh.

## U Sohriew

U sohriew (*Coix lacryma-jobi*) u long u uwei pat u jingthung uba ki ju rep ha ri Khasi-Jaintia. Une u long u jingthung uba kham jrong shibun ban ia kitei ki krai, ka ryenieng jong u ka long kumba haduh 6 phut. Une u jingthung ruh u long hi u kynja krai (*millet*) kum kitei ki krai ba la thoh haneng tangba u kham heh symboh. Ha ka jingdonkam jong u kum u jingbam ruh u ia syriem ia kitei ki krai, la um da long lehse uba da bha eh kum kitei ki krai haneng.

## Ki Dai, U Rymbaija bad U Rymbai-Ktung

Kiwei pat ki jingthung kiba nga kwah ban thoh lyngkot ha kane ka lynnong ki long ki kynja dai, u dai rahor (*Cajanus cajan*) u dai masur (*Lens esculanta*) u dai shana (*Cicer arletinum*), u daimuk (*Phaseolus mungo*), u dai motor (*Pisum arvense*), rymbaija (*Phaseolus calcaratus*) rymbai ktung (*Glycine max*).

U dai rahor u long u dai uba ngi shem bha kylleng ka ri India bad uba long ruh ha ki katto katne ki jaka them jong ka ri Khasi-Jaintia. Une u long u jingthung uba long man la ka snem (annual), hynrei, u lah ruh ban neh ar snem ne palat ruh. Ha ki jaka ha kiba kham bun u slap u long u jingthung uba piar bha ki tnat, kumta ba dei ban thung ia u ha ka jingjingai kumba lai phut na uwei ha uwei pat u lain, hynrei, ha ki jaka kiba kham duna ka um ki thung marjan ia u. Ka jingjan jingjingai ka shong ruh ha la ka jait ka jait. Don ki jaid rahor kiba piar ki tnat bad don ruh kiba shu long beit. La une u jingthung u donkam katto katne ka um ha ka por ba u san, la katta ruh um da donkam shibun eh ka um. Dei namarkata ka daw, ba um da long bha eh ha ki jaka bun slap jong ka ri Khasi-Jaintia. Ha ri dkhar, ha ki nongkyndong, ia u symboh ki syang ha ka ding shuwa ban tylliat ia u ha u maw tylliat. Habadei badei ki da kyllan bad ka umphniang bam, shuwa ban tylliat ia u khnang ba un ym lwet eh haba tylliat hynrei, tangba kan shu khuid ka snep bad ba u symboh un pait arliang. Une u jingthung u long ruh uba ki shait thung ban pynbha ia ka khyndew, namar u

long na ka iingkur (**family**) jong kito ki jingthung kiba nga la batai ha ki lynnong kiba mynshuwa kiba ki khot ki **legume** ha ka ktien phareng. U long ruh u jingthung uba don ki thied kiba khlain bha kiba lah ban kynroi wat ia ka khyndew kaba dait eh. Une u jingthung u lah ruh ban pyniap-op (**smother**) wat ia ki phlang kiba shitom ban phut kum ia u 'langsder. Ki ju pyndonkam ruh ia une u jingthung na ka bynta ka laha (**lac**), namar u khniang uba pynmih ia ka laha u long bha ha une u jingthung.

U dai saw lane u dai masur (*Lens esculanta*) uba ki khot ha ka ktien phareng **lentil** u long u jingthung uba long ha ki bun ki jaka jong ka Bengal bad Assam. U lah ruh ban long ha ri Khasi-Jaintia ha ki jaka kiba kham syaid. Ka Heiena Baruline, ka Russian kaba la minot bha ia u une u jingthung, ka ong ba don ar jaid (**two sub-species**) ki dai masur ha ka pyrthei, kiba heh symbai (**marcosperma**) bad kiba rit symbai (**microsperma**). Ki ju thung ia une u jingthung, da kaba shu bet (**broadcast**) ha ka khyndew kaba la lur. Lada leh kumne ka donkam kumba 30-50 kilo u symbai ha ka shi hektar bad ka jingmih pat ka long kumba 4 ne 5 kwintal.

U Dai shana (*Cicer arietinum*) uba ki khot ha ka ktien phareng **gram**, u long uba ngi shem ha kylleng ka ri India, hynrei u kham long bha ha ki jaka kiba kham duna u slap kum ha ka jylla Uttar Pradesh bad ha Punjab. Um da long bha eh ha Assam bad Bengal, bad kumta um lah ban long bha ha ri Khasi-Jaintia.

U daimuk (*Phaseolus mungo*) uba ki khot ha ka ktien Hindustani **mung**, u long uba ngi ju shem ha ki bun ki bynta jong ka ri India. U long u dai uba ha Punjab bad ha ka Uttar Pradesh ki kham sngewbha ban bam. Ia une u jingthung ki ju thung ha ki khyndew kiba kham khleh shyiap tangba kiba lah ban bat ia ka um. Ki thung kumha 20-25 kilo u symbai ha ki shi hektar, bad ki ju ioh kumba vintal u symbai na uba ki lah ban shna dai.

U dai matikalai (*Phaseolus aureus*) uba ki khot ha ka ktien Hindustani **urd** bad ha ka ktien phareng **black gram**, u long

uba iasyriem eh ia u dai muk; hynrei u symbai jong u mati kalai u long bunsien uba iong bad u jong u dai muk u long uba jyrngam – dei na kata ka daw, ba ki phareng ki khot ia u dai muk green-gram. Une u dai u long uba ki kham thung eh ha Punjab namar ba ki kham bam bha ruh ha kata ka jylla jong ka ri India. U jingthung ruh u long uba syriem ia u dai muk ha ki bun rukom, ha ka dur ka dar bad ha ka rukom thung ruh hynrei, u long uba kham bun ki shnuih ha ka met jong u baroh shirynieng. naduh u jyntang haduh ki sla bad u soh. Ki ju thung kumba 10-15 kilo u symbai shi hektar bad ki ju ioh kumba 10-12 kwintal u symbai.

U dai motor (*Pisum arvense*) u long lehse uba kim ju kham tip ha ri Khasi-Jaintia. Une u jingthung u long uba ia jan bha ka jingiadei bad u motor kper (*Pisum sativum*) bad uba ngi tip bha ha ri Khasi-Jaintia. Utei u motor na uba ki shna dai pat, u long uba ki shait thung bha ha ki lyngkha lum, bad namarkata ki ju khot kyrting ia u ha ka ktien phareng **field pea**. U motor kper u don u syntiew uba lieh, hynrei u motor lum u don u syntiew uba saw jngum (**purple**). Une u jingthung u long kham bha ha ki khyndew kiba kham dait, kata ki khyndew lam dewktieh, hynrei um lah ban long ha ka jaka kaba ktieh. kata ha ka jaka kaba lang um. Ka khyndew ka dei tang ban shu sngem. Ki ju thung ia u da kaba shu thung bret (**broadcast**), kumba 100 kilo u symbai ha ka shi hektar bad hadien kata ki sa tap ia u da kaba ring da ka lyntang (**planker**) lane da kaba trud ksam (**burrow**) ia ka khyndew.

U Rymbaija (*Phaseolus calcaratus*) u long uwei pat u jingthung uba ki ju thung bha ha ka ri Khasi-Jaintia. U rymbaija u don u soh uba kham rit ban ia u **cowpea** (kynnoh kawpi), bad u symbai ruh u long uba kham rit ban ia u kawpi. Ki sla bad ki syntiew jong u ruh ki iasyriem ia u kawpi tangba u syntiew jong u rymbaija u stem lane sawbthuh, lane u long saw jngum kum u syntiew jong u kawpi. Une u jingthung u long uba iasyriem eh ia u kawpi ha ka rukom ba ki pyndonkam ia u, kata lah ban pyndomkam ia u kum u jingthung uba tap ia ka khyndew (**cover crop**), khnang ban iada na ka jingtuid khyndew (**soil erosion**), lane lah ban thung ia u khnang ban

tep kylla ia u shapoh khyndew khnang ban pynsboh ia ka khyndew. Hynrei, ha ri Khasi-Jaintia une u long u jingbam uba kongsan tam, lait na ki dai kiba ki ioh na ri dkhar, uba ai ia kata, ka jaid jingbam kaba ki khot ha ka ktien phareng ka **protein** kaba long ka jingbam kaba tei ia ki dohksah. Nga ngeit ruh ba une u long u jingthung uba ngi dei ban thung kham bun, khamtam ban pynsboh ia ki kper soh namar u long u jingthung uba don kata ka protein kaba don shibun ka naitrojen.

U Rymbaiktung (*Glycine max*) u long u jingthung uba don kylleng ki ri kiba shaphang shatei lam mihngi jong ka ri India, kum ka ri China, Japan bad kiwei kiwei. Ha kine ki khyndiat snem kiba hadien u la roi bha ha ka ri America ruh. Ki thung ia une u jingthung khamtam na ka bynta ka umphniang kaba ki lah ban ioh na u symbai jong u. Ki thung ruh ia u na ka bynta u symbai uba ki bam kumba bam ia ki dai baroh. Ha ri China bad Japan ki pynmih dud bad bun kiwei kiwei ki kynja jingbam na u symboh jong une u jingthung. La ong ruh ba ki pynmih wat ia ka jri na u. Hooid, ki jingdonkam kiba mih na une u jingthung ki long kiba bun katta katta, bad ka long kaba eh ban niew kyrteng lut ia ki baroh. Ka rukom thung ia une ka long syriem ia u rymbaija.

Ha kaba kut ngan shu ong kyllum ba ki tei baroh ki long ki jingthung kiba bun bha ka naitrojen bad namarkata ki long ki jingthung kiba pynbha ia ka khyndew. Bad namar ba ki long kiba bun ka protin ki long ruh ki jingbam kiba iasyriem ia ka doh ki mrad baroh. Dei namarkata ka daw, ba ki nong India kim ju kham bam doh hynrei, ki bam kham bun da ki kynja dai. La katta ruh ka protin na ki jhur kam long kaba iaryngkat bad ka protin na ka doh.

## LYNNONG 16

### U TYMPEW

U tympew (*Piper betel*) u long u jingthung u ba wan lehse na Java bad u ba la wanrah sha kane ka ri jong ngi lehse da ki Portuguese. Ia une mynta ki thung ha bun ki jaka ka ri India, kum ka Maharastra, Bengal, Assam bad kiwei kiwei ki jylla. Ha Assam imat ki kham thung bha ha ka Surma Valley bad ha Meghalaya ha ki phang Riwar jong ka ri Khasi-Jaintia.

U tympew u long bha ha ka khyndew kaba sbur bha, kata ka khyndew ka bym da dait eh, bad kaba don shibun ki pyut jong ki dieng ki sla (**dead organic matter**). Kadei ruh ban long ka khyndew ha kaba ka um kam da neh slem eh, la u jingthung u donkam um man ka por. U long bha ruh ha ki jaka kiba shit bad ba sngem katta kum ki jaka Riwar, bad ki jaka dymmiew. Lada ka Khyndew ka kham duna ka sboh lane katei ka pyut jong ki dieng bad ki sla (humus) lah ban ai sboh da ka eit masi lane da ki jingthung kiba lah ban puh kylla kum da u rymbaija ne uno uno u jingthung uba iadei kur bad u. Haba thung ha ri ranab ruh, dei ban sumar ba ka khyndew kan ym tuid lehnohei sha ri thor. Kumba nga la ong ha ka lynnong kaba mynshuwa, kane ka khyndew kaba na jrong kalong ka sboh kaba bha eh ia ki jingthung baroh.

Ynda la lur ne puh ia ka khyndew, hap ban shna ki nur bad ki kynton ha ka jingjingai kumba shi mitar shiteng haduh ar mitar. Ia u tympew ki sa thung ha ka jingjingai kumba 15cm ha kine ki kynton. KI nur ki iarap ban kit noh ia ka um kaba bun eh. Namar ba u tympew u long kum u jyrmi, kumta donkam ban da thung da ki dieng ban kynshan ia u. Ha ki ri thor ki ju kyrshan ia u tympew da ki shken. Ia ki thning kiba ki pyndonkam ban thung ki ioh na ki lyngkha tympew ki barim. Ki ot lyngkhot lyngkhot ia ki jyntang jong u tympew bad ki da ieh kumba hynriew mat ha uwei uwei u thning. Ki juh dkhat ia

ki lai tylli ki sla kiba sharud bad ki ieh pat lai tylli kiba shaneng haba thung ia ki. Ia ki kliar jong u jyntang ki bret noh. Lah ban thung ha kano kano ka por kaba syiad bad haba ka khyndew ka ioh ka um kaba biang. Ynda la thung donkam ban ai um (irrigate) bunsien ia u, hynrei ym dei ban ioh palat eh ka um. Ynda ki la kham heh khyndiat lah ban ai sboh ia ki da ka sboh shaba jong u symbai tyrso lane da kano kano ka sboh shaba kaba lah ban ioh, bad lah ban khleh ruh bad u dpei. Ia kane ka sboh lah ban shu buh ha khmat u jyntang tympew. Ynda ki la kham heh pat ki sa kynton khyndew.

U tympew u shait ioh kawei ka jingpang kaba long na ka makariang kaba ki khot ha ka ktien phareng **fungus** bad ka kyrteng kaba thikna jong kane ka fungus ka long ***Rhizoctonia betae***. Kane ka jingpang ka pyniong ia u jyntang bad ka pyntlot ia u jingthung baroh uwei. Ban ialeh ia kane ka jingpang dei ban nym thung da u tympew uba la wallam na kano kano ka lyngkha kaba don kane ka jingpang bad ym dei ruh ban rep tympew ha kajuh ka jaka ha kaba don kane ka jingpang haduh katto katne snem. Ki kjat jong ki nong trei bri ruh ki lah ban kit ia kane ka jingpang. Lah ruh ban kham pynduna ia kane ka jingpang da kaba bet ia u tutia ha ka khyndew lane da kaba synreit da ka dawai kaba ki shna na u tutia bad ka shun bad ban pynlong ka jing khleh kumba nga la batai ha ka lynnong shaphang u phan.

Ka jingkheit tympew ka sdang kumba lai ne saw bnai hadien ba thung ia u, ki kheit shuwa ia ki sla kiba kham shapoh kumba ar lane saw sla na uwei uwei u jyntang. Bad ha ka por slap kumba 4-6 sla. Ki ju kheit ruh man la ka phra ne shiphew sngi. Ka bri tympew ka lah ban neh haduh san snem ne palat ruh, tangba ka jing sei sla ka nang duna duna hadien ka snem kaba san.

Ki don bun jait ki tympew hynrei imat haduh mynta ym pat don kano kano ka jingpyrshang ban wad bniah shaphang jong ki. Ha Assam imat ki kham thung da u tympew uba ki khot u 'pew desi, hynrei ha Bengal ki kham thung da u 'pew parua, lane ia u 'pew puathi lane u 'pew sanshi. U tympew khasi imat u iapher na kitei ki jaid tympew.



**Ka jingbam kwai bad u tymphew imat ka long ka jingmlien kaba tang ha ri India. Imat kaba bam kwai hadien ba la lah bam ja ka iarap ia ka jingtyllait ia ka jingbam. Hynrei ka bam khlemakor naduh dang step haduh ynda miet, lane ha ki por baroh, ka long khlem artatien kaba mynsaw na ka bynta ka jingkoit jingkhiah bad kaba i said met bad kaba pynsniew ia ka dur.**

## LYNNONG 17

### U KWAI

U Kwai (*Areca catechu*) u dei u jingthung uba long ban rep tang ha ki jaka kiba shit sngem. Ia u kwai ki briew ha ri India ki la nang ban pyndonkam la bun bun snem ym tang ha kaba bam kai bam myllen hynrei, ki ju pyndonkam ia u ha ka leh naim leh rukom.

Ia ka jaka tynrai na kaba une u jingthung u mih nyngkong ym lah ban pynthikna tang ba imat dei hi ha kine ki thain Asia khamtam kito ki jaka kiba harud duriaw. Ka ri India ka pynmih haduh kumba ar lakh ton u kwai ha ka shisnem na kumba arphew lakh san phew hajar hektar.

#### **Ka Rep Kwai**

U kwai u long u jingthung uba jrong bha bad ki sla jong u ki mih tang na kliar. Ngi khot ia kine ki jait dieng ki **palm**. Ka jingjrong jong une u dieng ka pher na kawei ka jaka sha kawei pat, bad u lah ban jrong haduh 90 phut (27mitars).

U dieng kwai u mih ha ri them bad ha ri lum, tangba ynda thung ia u sha ki jaka kiba kham jrong um da sei soh bha shuh. Ka jaka rep ia une u jingthung ki dei ban long ki jaka ha kiba ka jingshit jingkhriat ha ka lyiur bad ka tlang kam da ia pher than. U dieng kwai u sei soh bha ha ki jaka kiba ka jingshit ka long hapdeng ka 15°C haduh 38°C.

U Kwai u mih ha ki jaid khyndew bapher bapher, naduh ki khyndew laterite bad khyndew loam jong ka ri India ba shathie, ki khyndew alluvial jong ka Assam, Bengal haduh ki khyndew colluvial kiba ngi shem sha ki thain war ka ri Khasi Jaintia. Kaba kongsan ka long ba ki bri ki dei ban don ka khyndew kaba jylliew bad ha kaba ka um kan ym neh slem eh. Kan bha shibun lada don ki dieng kiba jrong, ban iada ia u dieng kwai na ka jingthang palat ka sngi khamtam na ka liang lam sepngi.

Ban buh symbai ia u kwai, ngi donkam ban da jied ia u kwai na ki dieng kiba ju kham soh kloï bad seisoh bha. Dei ruh ban da jied da ki kwai kiba la ih bha bad ban kyntait noh ia kito kiba thoh dak bad ba sniewdur. U kwai uba ki la jied janai kumtei ki ju thung shwa ha ki 'per sara lane norsari.

Ha Bengal, Orissa bad ki ri India ba shathie, shwa ba kin thung ia u kwai ha ki norsari, ki ju pynspeh shwa ia u kumne. Ki tap ia u kwai da u shyiap ha ki jaka kiba kham tngen bad ki ai um ia u barabor (irrigate) bad hadien sawphew sngi ei ei u kwai u sdang speh. Hadien lai bnai lane ynda, u la sdang slap kin sa rah tynrai noh pat sha ki jaka norseri kaba ki la pynkhreh bad ai sboh bha bad ki thung pat ia u ha ki jingjingai kaba 30 cm (shiphut) na uwei sha u wei pat. Ia kine ki norsari ki da shna de da ki jingker ban da ia u jingthung na ka jingtangon eh ka sngi. Ynda dap khadar haduh khadphra bnai ki rah ban thung noh pat sha ki bri.

Sha ri jong ngi, ki nongrep kwai ki jied ia ki jaka kiba kham sngem bad ki sara beit ia u kwai hangto khlem da pynspeh shwa ia u. Ki ieh ia u hangto haduh kumba lai snem ei ei bad ki sa rah tynrai ban thung pat ha ki bri ha ki bnai slap. Naba peit thuh ia u dieng uba kham bun mat ha u dieng met jong u hadien ba la thung ngi lah ban batai ba un long u dieng u ban kham sei soh.

Ka por ba bha tam ban thung ia u kwai ka long ha ki bnai slap kata ha ki bnai June-July. Lada ioh slap kham kloï lah ruh ban thung ia u ha u bnai May. Shwa ban thung, ki ju tih ia ki thliew kaba jylliew kumba 60 cm. (2phut) sawdong bad ki buh ia u dieng ha pdeng bad ki sa pyndap khyndew. Dei ruh ban da khem bha ia ka khyndew na baroh sawdong. Ia ka jingjingai na uwei u dieng sha uwei pat ki ju pynlait kumba 2.70 mt. (9phut).

Kham bunsien ki jaka rep ia une u jingthung ki long ki jaka baheh slap, bad kumta ki khyndew kim da long kiba sboh namar ka jingtuid ka khyndew. Kumta khnang ba ngin ioh ia ka jingmih bad jingseisoh ka ban iai neh, ngi dei ban ai ia ki jingbam kiba u jingthung u donkam. Ia kane ka jingbam lah

ban ai lyngba ki sboh nuit, sboh jingri bad na ki sboh fertilizer kiba don ia ka naitrojen, phosphorus bad potassium.

U dieng kwai u shim por bun snem haduh kumba hynniew lane phra snem ba un sdang ban soh. Khnang ban yn nang ioh jingmyntoi bad un ym leh- nohei ka jaka, lah ban nang thung da ka kait, u soh marit lane u tympew ha ki bri kwai.

### **Ki Khniang bad jingpang Kwai**

Na ka liang u khniang, u kwai ym da don eh kita ki ban da pynjutor than eh ia u dieng. Kiba ju kham iohi ki long ki kynja khniang kiba rit (**scale insects**) kiba kjit ia u dieng bad uba ki khot u **arecanut beetle** (***Araecerus fasciculatus***) uba bam ia ki sla bad ruh ia ki soh.

Ki don ruh katto katne ki jingpang kiba ktah ia u diengkwa. Ka tram sla lane ka leaf blight (***Contothyrim area***) ka dei ka jingpang kaba pynthoh dak ia ki sla bad kito ki sla ki hap noh sha khyndew. Ka jingpang kwai kaba kham pynjutor ia ki bri ka dei **arecanut bud rot disease** (***Phytophthora palmivora***). Kane ka jingpang ka la sdang ban kynrei bha ha ri Khasi. Kane ka jingpang ka pynpyut ia u shylluit uba mih hapdeng, bad hadien u ktah lut ia u dieng baroh uwei. U dieng uba la kem pang u sma iewtung bha. Kane ka jingpang ka kham roi hadien ba la slap, haba ka bneng ka lyhop bha. Ka kham duna ha ki por tlang bad ha ki por jur slap. Ban iada na kane ka jingpang lah ban pyndonkam da ka dawai kaba ki khot ka **metalaxyl**. Synreit lane spray ia kane ka dawai da kaba pyndonkam da ka **foot sprayer** ar sien shi snem, shisien shwa ki bnai slap kata ha ki bnai March bad shisien ha ki bnai September –October, hadien ki bnai slap.

Ngi dei ban kynmaw bha ba ngi dei ban synreit ia kane ka dawai la kumno kumno ar bnai shwa ban kheit ia u kwai.

U kwai u sdang phuh syntiew naduh ki bnai February-May bad u soh u sdang ih pat naduh ki bnai November-December katkum ki jaka jaka.

Haba u sdang ih, u kwai u kylla na ka rong jyrngam sha ka rong stem bad ynda u la ih bha u kylla rong saw. Ka aiom kheit

kwai ka sdang naduh u bnai December bad ka neh haduh u bnai March – May.

Kiba bun hi ha ri India kim ju bam ia u kwai im uba ki khot u **katcha supari** hynrei ki kham bam da u kwai uba la thad tyrkhong uba ki khot u chali supari. Ngi pat ha ri Khasi ngi bam wai-im ha ki bnai tlang bad u waiskop ha ki bnai lyiur. Ha ki thain Garo Hills, ki don kiba bam da u kwai uba dang lung bad dang jyrngam. Imat u lah ban don la ka jong ka jingmad.

Ban shna ia u chali- supari, ki ju thad rkhiang ha madan ba la siang dew bilat haduh ba un da tyrkhong bha, bad ka um ha u kwai ka sah satang kumba 10 na ka 100 (10%).

U Khasi hyndai, uba stad, u la lap ia ka buit ban buh ia u kwai ha um bad ban pynkylla 'waiskop ia u. Ia kane ka rukom pdem kwai ngi shem imat tang hangne ha ri Khasi. Ki pdem ia u kwai ki ju shna da ki pukhri kiba jylliew, teng teng haduh 4 m. (12phut). Ki thep ia u kwai ha ki kria kiba la shna kyrpang da ki siej bad ki sa pdem ia ka ha kine ki pukhri ba la pyndap um. Ki pdem ia u kumne haduh san bnai lane haduh ban da lut u 'wai-im.

Nalor u soh uba ngi bam, kiwei kiwei ki bynta jong une u jingthung ruh ki long kiba myntoi. Ia u snep kwai lah ban shna kot bad Card-board. Na u kwai u bym pat ih, lah ban ioh ia ka tannin ka dawai kaba ki pyndonkam ha ki karkhana shna snieh. Ia ka dop-wai ki pyndonkam haba song jingsong bad ia u dieng met pat ki pyndonkam haba shna iing shna sem. Nga ngeit ba ka por ka la poi ba ngi dei ban sdang wad jingtip shuh shuh shaphang ki rukom ia une u jingthung khnang ba ngin kham ioh myntoi da kaba rep ia u.

## LYNNONG 18

### U SLASHA

U Slasha u long uwei pat u jingthung uba nga ngeit u lah ban roi shibun ha ri Khasi-Jaintia. Une u long u jingthung uba ki thung bha ha Assam, Darjeeling bad ki jaka shaphang shathie ka ri India. La shem ba u dieng slasha u mih hi ha ki khlaw ki btap naduh shuwa ba ka pyrthei kan tip shaphang jong u. Hangne ha ri Khasi-Jaintia jong ngi, la sdang ban thung nyngkong eh ha ki snem 1977-78 ha Umsning bad ha Riango. La pyrshang ha kine ki jaka da ka jingpeit bad jingkhmih jong ka tnat treikam kaba iadei bad u slasha jong ka Sorkar kmie, ka **Tea Board of India**, hadien ba la shem ba u slasha uba thung ha kine ki jaka u long uwei na kiba bha tam, ka Sorkar Meghalaya ka la sdang ban pynroi ia ka rukom thung da kaba pynshlur ia ki nongrep lyngba ka jingpyniaid ka Department jong ka Agriculture. Ia une u diengslasha ki Khasi, ki tip ia u kum u **diengtyrnem**.

U Slasha u long bha ha ka khyndew kaba sbur, kata ha kaba don shibun ka pyut jong ki dieng ki siej bad ha kaba ka um kam ju neh slem. Namar ba u long uba don kyrhai ha ki jaka kham ri dkhar, nga ngeit ba kine ki jaka ki long kiba bit eh na ka bynta u slasha. Ki jaka khlaw kiba shaphang ryngai ki long kiba bit na ka bynta ban thung slasha.

Ia u slasha ki thung na ki dieng kiba ki lah thung nyngkong ha ki jaka sara. Ki symbai ki kham long bha haba poi ka por khriat. Khnang ban ioh symbai na u diengslasha, ki ju thung ha ka jingjingai kaba 10 phut uwei na uwei, bad ynda u la saw snem ki sa ngor noh ia ka tnat bah kaba napdeng. Hynrei ynda ka kper slasha ka la don kumba 10 snem ki ju pynkhyllern noh katto katne ki diengslasha khnang ba ka jingjingai uwei na uwei kan long kumba 14 la 20 phut. Ia ki soh, kiba don u symbai ki lum ynda ki hap ha tbian bad nangta ki sa buh ia ki ha ki thliw kiba sngem kiba la tap da u phlang. Kane ynda katto katne sngi ka pynjem ban khlaw ia ki shyieng. Lah ban ioh ia

kine ki symbai ha u bnai November ne December bad ia kine ki sa rah ban thung ha ki jaka sara.

Ka jaka sara ka dei ban long hajan ka kper slash, khnang ba kan kham suk, ha kaba kit ba bah ia ki dieng sha kper. Ia ki symbai ki thung ha ka jingjingai kaba 5 inshi uwei na uwei, kata lada thung noh ia ki sara haba ki dang 6 bnai. Hynrei, ki ju thung ia ki symbai ha ka jingjingai kaba 10 inshi uwei na uwei bad lada ki thung ia ki sara ynda ki la ar snem. Ia ki jaka sara donkam ban da shna da ka kyndun kata ka jaka dara kaba la sop da u phlang khnang ba kan iada ia ki sara kiba dang rit na ka sngi. Kan kham bha lada kane ka kyndun (**tatched covering**) kan long kumba san phut na ka khyndew. Haba phut ia ki sara ban leit thung sha kper, dei ban da leh sumar khnang ba ka khyndew kan snoh ha ki thied lym kumta ki sara ki lah ban iap. Ia ki sara ki thung ha ka jingjingai kaba 100 cm x 70 cm. Kumba 8 ne 10 kilo u symbai un biang na ka bynta ka kper slash kaba shi ekar ka jingheh. Lah ruh ban thung ia u symbai ha ki plastik kiba ka jingthew ka long 6cm. ka pyngkiang bad 8cm. ka jingjrang. Hadien 9 haduh 12 bnai la long ban rah sara. Ia ka rukom shna ia ki jaka sara bad ban iada na ka sngi ka long kumjuh kumba la kdew haneng. Kane ka rukom thung symbai ha ki plastik ka iarap shibun khamtam ha kaba rah ia ki sara sha ki jaka kiba jngai.

Khnang ba u dieng un kham pynmih kham bun ki sla kiba bit ban shna slash, dei ban khap pynmadan ia u na khlieh kumba 18 inshi na ka khyndew, bad ban ngor noh kiwei ar ki tnat heh. Ia kane ka jingkhap bad jingngor lah ban leh man ka snem ne man ka ar snem. Ia kane ka jingkhap ki ju leh ha u bnai December ne u bnai January bad tang shu lah khap kumne ki ju kara ia ka khyndew ban pyniap ia ki nuit ki nier baroh.

Ka jingkheit slash ka sdang ha u bnai March, bad lah ban kheit haduh hynriew sien ne palat ha ka shi snem. Haba kheit ki ju shyit ar tylli ki sla kiba kham heh ryngkat bad i shylluit, kane ka pynmih u slash uba kham bha. Lada shyit haduh lai be saw ki sla bad u shylluit lah ban ioh kham bun u slash, hynrei, um da kham bha eh. Ia ki shylluit kiba sharud u dieng ka khambha

ban iehnoh, khnang ba u dieng un piar bha bad un tap ia ki nuit ki nier kiba hatrai dieng, bad ki tnat kiba sharud kin iasan ryngkat bad kito kiba napdeng. Ki slasha kiba ki kheit ha ka synrai (kata ha u bnai August) ki long bunsien kiba bha tam.

U dieng slasha u donkam shibun ka sboh kum ka sboh jingri lane da ka sboh jingthung. Ki dieng slasha ki donkam ka jingiada malu mala na ka sngi. Kumta teng teng ki ju thung da ki dieng ban kah syrngiew bad ha kajuh ka por ban pynsboh khyndew da ki sla kiba hap na ki, kum kine harum: ***Albizzia stipulata* (black sirris), *Albizzia lebbec* (white sirris), *Albizzia procora*, *Dalbergia Assamica*, *Dalbergia sissoo* (u dieng shisham) bad *Dorris rubusta*.**

U dieng slasha u don shibun ki jingpang bad ki khniang kiba pynshitom ia u. Ki riewstad ki dang wad buit kumno ban pynduh ia ki. Imat ba don katto katne ki jaid dieng slasha kiba lah ban ialeh pyrshah ia ki katto katne ki khniang, kum ia ka khniang kaba ki khot ha ka phareng **the tea mosquito bug (*Helepelitis antonii*)**. Kaba synreit da ka um kaba la khleh da ka shun bad u kyndok ka kham pynduna ym tang ia kine ki jingpang, **brown blight (*Collatotrichum camaltia*), grey blight (*Pestolozzia thede*) bad blister blight (*Exdea idlum rexan*)**, hynrei ki pyniap ruh ia ka khniang kaba ki khot ka **red spider (*Phytopus carinatus* & *Telronychus bioculatus*)**.

Ka jingshna slasha ka long ha ki saw kyrdan (stages), kumne: kumba 75 bynta na ka shispah bynta jong ka sla baroh kawei ka dei ka um. Donkam namarkata ban pynmih noh mar shiteng jong kane ka um shuwa ban pynkli ia ki sla. Kane ki leh da kaba pyniap stai ia ka sla. Ia kane ki leh da kaba thad ia ki sla ha ka kamra kaba iaid bha ka lyer haduh kumba 18 ne 20 kynta, ha ka jingshit kaba kumba 85 ne 90 degree (Fahrenheit). Lada thad ha madan donkam ban da siang da ka shylliah lane da ka jain bha ba la shna khnang na u sainalia. Ynda ka sla ka la biang ka jingiap stai, ka la jem bad jwat bad ka la long bha ban pynkli ia ka. Ka sla kam dei ruh ban duh ia ka jingjyrngam bad ka jingiwbiha ynda la dep ka jingpyniap stai.

Kaba pynkli ia ki sla pat ka bud ia katei ka jingpyniap stai.



la kane ka jingpynkli ki leh mynta ha ki kor kiba la shna kyrpang na ka bynta kane. Hynrei ha ki kper slasha kiba rit ki ju pynkli wat da ki kti lane da ki kor kiba ki shna ha da ki dieng (**wooden roller**). Ka daw balei pat ki pynkli ia ki sla ynda lah pyniapstai ia ki ka long namar ba da kaba leh kumne ka um napoh ki sla ka mih shabar bad ka per bad ka tap ia ka sla baroh kawei. Ynda kane ka um ka la rngat, ka sah halor ka sla tang kato kaei kaei (**substance**) kaba um, tang shu theh da ka um thnam halor u slasah. Katba nangpynkli, ka um kaba mih na ka sla ka iakynduh bad ka oksigen na ka lyer bad kane ka iatrei bad kata ka um ban pynkylla ia ka sha kata ka kynja met kaba pynbang ia u slasha. Ka sla ruh ka sdang ban kylla rong, bad ka rong ynda dep ka jingpynkli ka long syriem ia ka rong tama.

Ynda la pynkli ia ki sla, ki rah ia ki sha ka kamra kaba iaid bha ka lyer bad kaba khriat bad kaba la siang da ka dewbilat. Khnang ban pynkhriat ia kane ka kamra, ki ju synreit da ka um ia ka tbian baroh kawei. Ia ki sla ki buh halor ka kynja ryndan ka bym da jrong eh na tbian, lane halor miej tin. Ki phriang ia ki sla haduh kumba shi inshi ne haduh 4 inshi ka jingjylliew bad ki sa tap na jrong da ka jain sngem, tang ba kane ka jain sngem kam dei ban ia kynduh bad ki slasha. Kumta dei ban da tap najrong da ka phrem nar (**wire frame**) shuwa ban tap da ka jain, lane dei ban pyndonkam da ka jain jri khnang ba kan ym kjit um na ki slasha. Kaba leh kumne kan pynih ia ka sla, bad kane ka jingpynih kan shim por kumba ar kynta haduh khadlai kynta katkum ka jingshit jong ka kamra. Kaba bha ka long ba ka kamra kan ym dei ban shit palat ia ka 85 degree (Fahrenheit). Lada ka slasha ka don ka rong tama lam byrtem, kata ka ih bha, bad lada ka don sa ka jingiwbihih soh kata ka nang khambha shuh shuh. Ynda ka sla ka la ih, donkam pat ban pynrkhiang ia ka. Ia kane ruh ki leh mynta da ki kor kiba heh. Khnang ban pynrkhiang ha kine ki kor, ki donkam ka lyer kaba khluit, kaba ka jingshit jong ka ka long kumba 200 haduh 270 degree (Fahrenheit). Ha kaba nyngkong ki pynkiew ia ka jingshit, hynrei katba ki sla ki nang rkhiang, ki nang kham pynduna ia ka jingshit. Ynda la pynrkhiang, ki slasha ki la bit ban buh ha ki synduk kiba la sop da ka sisa bad ban shalan shabar.

## LYNNONG 19

### U KOPHI

U Kophi u long u jingthung uba dang wan shen sha ri Khasi-Jaintia bad hapdeng kine ki khyndiat snem ki nongrep ki la ithuh bha ia u. Hynrei ka jingrep kophi imat kam da roi stet kumba ngi khmih lynti. Nga ngeit namarkata, ba kane ka jingthoh ha kane ka lynnong kan kham pynroi ia ka jingrep kophi ha ka ri lum Khasi-Jaintia jong ngi.

U Kophi imat u long u jingthung uba la wallam ba ka ri Africa ha kaba ngi shem bun jaid (**species**) ki kophi. Ki Kophi ha kata ka ri ki mih ha ka khlaw ka btap. Don ruh u jaid kophi u ba dei uba mih nyngkong eh ha kane ka ri Khasi-Jaintia ia uba ki khot u *Coffea khasiana*. Ia une la shem ba u don ha ka shnong Nongwar, sha thain Sohra. Hynrei na kine ki kophi kiba bun jaid, don ar jaid kiba ki ju thung eh na ka bynta ba kin shna ia u kophi uba ki pyndonkam na ka bynta ka jingdih, kine ki ar jaid ki long (1) *Coffee robusta* bad (2) *Coffee arabica*. Une u ba nyngkong u long uba kham met bah ban ia uba ar, u lah ban jrong naduh kumba 15 haduh 25 phut had ka met (**trunk**) ka lah ban long haduh kumba 8 inshi, na shiliang ha shiliang (**diameter**). Hynrei haba rep ia u kata dei ban ialeh ban pynneh ia ka jingjrong jong u hapoh hynriew phut. Ka rukom san jong u arabica ka long kat kum ka jaka, lada ka long kaba lait na ki dieng bah kata u piar bha ki tnat, bad ki tnat ruh ki mih naduh jan khyndew. Hynrei ha ki jaka kiba kham shah ki diengbah, une u kophi u lah ban don tang uwei u met bah uba jrong tang kumba 6 phut ne kham palat ruh. Tangba ha ba rep ia u arabica ki ju pynneh ia ka jingjrong jong u tang hapoh lai phut. Ki symboh jong u kophi robusta kim da heh eh kat ki jong u kophi arabica hynrei, ka jingmih na une u kophi ka kham palat ban ia kaba na u kophi arabica. U kophi uba ki ioh na u arabica pat, imat u kham bha ban ia u robusta. U robusta imat u kham lait ruh na ki jingpang bad na

ki khniang kiba pynjot ia u, hynrei u kham iap kloï ban ia u arabica lada duna ka um ha ka khyndew. Ha ki jaka kiba kham jur u slap pat u kham mih syntiew bad soh kham bun ban ia u arabica. U kophi robusta u don ruh kham bun ki thied kiba pur hajan ka sla khyndew. U soh ruh imat u kham shimpur slem ban long ha u robusta, ka shim por kumba 7 haduh 8 bnai ei ei, naduh ba mih ki syntiew, hynrei ha u arabica ka shimpur tang kumba 6 bnai ne.

U kophi u long bha ha ki jaka kiba ka jingjrong (**altitude**) jong ki, ka long kumba 1000-1500 mitar bad u, robusta pat u long bha ha ki jaka kiba ka jingjrong ka long kumba 500-1000 mitar. U mih kham bha ruh ha ki jaka ha kiba don katto katne ka jingkah sngi na ki dieng bah. Ha ri Khasi-Jaintia imat um da long bha lada ka jingjrong jong ka jaka ka palat ia ka 4000 phut. Ka khyndew ha kaba ki ju thung kophi ka dei ban long kaba sbob bha. Ka khyndew thymmai (**virgin soil**), kata ha kaba ym pat ju thung jingthung, hynrei kaba dang shu lah shyrti ka long kaba bha eh na ka bynta u kophi. Ka dei ban don shibun ka pyut ki dieng ki siej lane jong ki jingthung-jingtep bad kaba sbur bha. Nga ngeit ba ki khyndew ha kiba ki thung kophi ha ri Khasi-Jaintia ki donkam ruh ia ka sbob shyieng sbob dpei bad kiwei kiwei ki kynja sbob. Ha ki katto katne ki ri ki shem ruh ba kaba tap ia ka khyndew da u kynja phlang ia iarap shibun ban pynmih soh kham bun. Kaba leh kumne ka iapher na kaba thung ia u jingthung uba tap ia ka khyndew (**cover crop**) kumba nga la batai ha shuwa. U phlang uba ki pyndonkam ban tap ia ka khyndew u long u 'langiap uba iasyriem ia u sder. Da kaba leh kumne ki ngeit ba ka jingshit jingkhriat jong ka khyndew kam da kiew ne hiar eh. Ia kaba leh kumne ki khot **mulching** ha ka ktien phareng bad ia une u phlang ~~lane~~ kano kano kaba ki pyndonkam ban tap kumne ki khot ha ka ktien phareng **mulch**. Ka jingthung kophi ha syndah ki maw kumba ki ju leh ha ri Khasi nga ngeit ka long namar ba ki maw ruh ki trei kum ka mulch. Ka sbob eit masi, ne eit blang, ne eit sniang, ne eit kulai, ne kano kano ka eit ruh, ~~kan~~ pynsboh ia ka khyndew bad pynbha ia u kophi.

Ia u kophi, kum ia u dieng slasha, ki da thung shuwa ha ki jaka sara. Ka bha ban thung ia u symbai uba dang shu lah phlait na u soh, tang ba ka kham bha ban da khleh ia u symbai bad u dpei lane bad ka dewrkhiang lada ka dohmet ka dang sah ha u shyieng. Ki jaka sara ki long kumba san phut ka jingiar bad ka jingrong katkum ka jingdonkam. Ia ki symbai ki thung ha ki lynter kiba ia jngai kumba 6 inshi bad ha ka jingjingai kumba 6 inshi na uwei u symbai ha uwei pat. Ka bha ruh ban da shna ki kyndun ka ban ai jingkah katto katne na ka sngi ha ka por ba shit eh. Hynrei lada ka jaka sara ka long ha khlaw lane ha ka jaka ha kaba kah ki diengbah, kane ka kyndun lehse kam da donkam eh. Katba ki sara ki nang heh katta ki nang pynshah sngi khnang ba kin kham eh bad ba kin ym ioh ia ka jingpang kaba ki khot ha ka ktien phareng **damping off** kaba shait ktah ia ki sara haba ki dang rit. Kane ka jingpang ka wan na ka khyndew lada ka khyndew kam ioh sngi bha. Ynda ki sara ki la don kumba shisnem ki sa thung ia ki ha bri. La katta ruh ka rta jong ki sara ka lah ban long naduh kumba 6 bnai haduh 2 snem. Ka kham bha ban thung da ki sara kiba dang kham rit ban ia kiba la heh, tangba ba kiba rit ki donkam kham bun ka jingsumar ban ia ki ba la kham heh. Lada thung da kiba la heh, ki ju mait noh ia ki kliar kumba shi taiew shuwa ban leit thung ia ki sara, hynrei lada thung da ki sara kiba dang rit, ym donkam ban da mait ia ka kliar jong ki. Ia u robusta kophi ki ju thung ia u ha ka jingjingai kumba 9 phut uwei na uwei, hynrei ia u arabica kophi ki ju thung ia u ha ka jingjingai kumba 6 phut uwei na uwei. Haba thung ia ki sara dei ban da sumar ba ki thied kin ym kyllain ne sohsat, hynrei dei ban da pynpiar bha ia ki ha khyndew bad ban da tyngsah bha ia ka khyndew ynda la thung. Kaba bha ruh ban da tih thliew lypa katto katne sngi shuwa ban thung ia ki sara. U kophi imat u donkam katto katne ka jingkah sngi ha ka bri ruh. Hynrei lada kah syrngiew eh ki dieng, kata ruh kan pynduna ia ka jingseisoh jong u dieng kophi. U robusta imat u kham lah ban shah ia ka jingkah ki dieng kham bha ban ia u arabica, kata lah ban thung ia u arabica ha ka bri ka bym don dieng bah ei ei.

U kophi u don bun jaid ki khnaing bad ki jingpang kiba pynshitom ia u. Na ki khniang kiba ngi shem ha kane ka ri, kiba pynjulor ia u kophi imat kine harum ki long kiba kham pynjulor ban ia kiwei: (1) u **niang samthliew** uba lieh (*Xylotrechus quadripes*) uba ki khot ha ka ktien phareng **white stem borer** uba ju kham pynshitom bha ia u arabica bad (2) **niang snep (scale insects)**, kawei kaba jyrngam kaba la ai kyrteng *Lecontum viride*, bad kawei pat kaba saw bthuh bad kaba la ai kyrteng *Salssetia hemisphaerica*. U niang samthliew u long u niang byrnai uba rit uba sam thliew ia ka metbah lane ia ki tnat uba jrong tang kumba 1 inshi uba don ki thapniang kiba long bthuh bad kiba thoh lieh. U don ki tmain (**antennae**) kiba jrong bad ki kjat ruh kiba jrong. Une u khniang u kha pylleng ha ki snur ne ki jingpdang ne ki khap jong ka snep jong u dieng kophi. Na kine ki pylleng ki mih ki naingbyrnai kiba samthliew ia ka snep dieng bad hadien kata ki rung shapoh bad ki sah hapoh u dieng haduh kumba 8 bnai. Ynda ki la heh bha kine ki niangbyrnai ki long kumba 2 haduh 4 inshi ka jingjrong. Khnang ban pynduna ia ka jingpynjulor kine ki khniang dei ban sar ia ki pylleng, lane ia ki niangbyrnai kiba dang mih da u synsar ne u brut uba eh, lane dei ban thang ia ki tnat bad ki dieng iap baroh ha kiba kine ki khniang ki don. Ki niang snep pat ki long ki khniang kiba rit katta katta kiba sop ia ka snep jong ki tnat ne jong ka met bah lane ia ka sla ruh. Ka kynthei ynda ka la heh ka long kum u skain rit. Lada ngor ia ki tnat baroh ha kiba kine ki khniang ki don, kan pynduna shibun ia ki ha ka bri kophi.

Ka jingpang pat kaba ngi ju shem eh ha u kophi ka long kaba ki ong ha ka ktien phareng **die back** lane ka jingpang iap dadien. Kane ka jingpang imat ka long kaba bud ia ka jingpang jong ki sla kaba ki khot ha ka kyrteng saians *Hemilia vastatrix*. Kane ka jingpang hemilia ka paw nyngkong kum ki jingat phylloit phylloit kiba stem sha ka liang kaba pyllup jong ka sla. Kine ki jangat ki long kiba rit, hynrei ynda ki la bun bha ki tap lup ia ka dieng jong ka sla baroh kawei haduh ba ka bri baroh kawei ka shu stem. Ka daw kaba ju pynioh ia kane ka jingpang ka long ka jingsoh than jong u dieng. Khnang ba u

dieng kophi un ym ioh ia kane ka jingpang ki ju mait ia ka kliar jong ka met bah ba kumta ka lah ban pynmih kham bun ki tnat. Ki ju thung ruh da ki dieng bah ba kin kah syrngiew malu mala ia ki dieng kophi. Kaba tap ia ka khyndew da ka kynja mulch ruh, ki shem ba ka kham pynduna ia kane ka jingpang. Ha Mysore ki shem ba kaba synreit da ka dawai ia u dieng, kum da ka **bordeaux mixture** ka iarap ban pynduh ia kane ka jingpang. Nga lah ban ong ba haduh mynta hi la shem ba ki khniang bad ki jingpang kiba pynshitom ia u kophi ki dang duna shibun ha ki thain shatei lam mihngi jong ka India bad lehse, kane ka long ka jingkyrkhu ia kito kiba rep bad kiba mut ban rep kophi.

U kophi u sdang puh syntiew ha u bnai March bad ia ki soh ki sdang kheit ha u bnai October haduh January. Ynda la kheit ia ki soh kophi, kaba nyngkong kaba dei ban leh ka long ban khoh ia ka snep jong u. Ia kane ha ki bri kiba rit ki ju leh da kaba dung ha u thlong, hynrei kane kam long kaba da bha eh namar shibun ki symbai ki pait ne lwet. Don ka kor kaba ki khot ka **pulping machine** kaba lah ban leh ia kane. U misteri uba stad u lah ban leh kham bha ia kane. U misteri uba stad u lah ban shna ka kor khohsnep da ka nar ruh. Ynda la khoh ia ka snep, ia ki shyieng ki buh ha ki pipa kumba 16 kynta khnang ba ka blein blein kaba snoh ha ki symbai kan ioh ban pyut (**ferment**), hadien kata pat ki sa sait ia ki da ka um. Tang shu lah sait pat ki sa pynrkhiang ha ka sngi. Khnang ba u shyieng un rkhiang bha ki ju kynroi da ki kjat ia ki shyieng kiba dang thad kumne ban kylla ia ki ba ka sngi kan ioh ban shoh ha ki symbai baroh. Nangta pat ia ki snep jong ki shyieng ki sa khoh da ka kor. Ynda ki la lah khoh pat ki sa peh noh ia ki snep bad pynsah satang ia u symbai uba khuid bah.

Ngi ai'hangne ia ki katto katne ki mat ki ban iarap ban pyniapher ia u kophi arabica na u kophi robusta :

U Kophi arabica	U Kophi Robusta
U soh u saw iong ne stem bad kham'heh	Ka'rong u soh ka long saw syniang bad ka thoh saw jngem haba'u la ih bha bad kham rit.

U Kophi arabica	U Kophi Robusta
<p>U dieng u kham ieng beit.</p> <p>Ki sla kiba shalyntoin (<b>elliptical or oval with pointed tip</b>)</p>	<p>U dieng u long syriem iaka shatri.</p> <p>Ki sla kiba heh bad kiba ran sti.</p>

## LYNNONG 20

### U KEW NEPAL BUCKWHEAT

U kew Nepal u long u jingthung uba dang wan shen sha ki ri lum Khasi-Jaintia jong ngi. U iapher shibun na utei u kew uba nga la thoh ha ka lynnong kaba khadlai. Utei u kew uba ha ka lynnong kaba khadlai u dei na ka ing kur jong u kba, u barli, ki krai, bad kiwei kiwei ki jaid phlang. Hynrei, u kew Nepal um dei na ka iingkur ki phlang (**Gramineae family**), hynrei u dei na ka iingkur u **rubarb**, u jarain bad kiwei kiwei ki jinghtung kiba iapher bha na ki phlang. La khot **buckwheat** ia u lehse namar ba ki German ki pyndonkam ia u kum u kew bad namar ba ka dur jong u shyieng ka long kum ki symbai jong u dieng beech, bad kumta ki khot ia u, u **buckweisen** ha ka ktien German, haba la kylla sha ka phareng **buckwheat**. Dei na kane ka daw lehse ba ki Khasi ruh ki khot ia une u jingthung u kew. Nga sngew dei ban khot ia u, u kew Nepal namara ba la wallam nyngkong ia u sha ri Khasi da ki shipai kiba wan na Nepal bad namar ba nga kwah ban pyniapher ia u na u kew uba shisha. Imat don ar jaid (**species**) ki kew Nepal ha ka pyrthei kiba ki kham thung bha: uwei na ki, ki khot **Fagopyrum esculentum** bad uwei pat uba ki khot **Fagopyrum tartaricum** ha ki kyrteng saians. U **esculentum** imat u long uba ki rep ha Germany bad kiwei kiwei ki ri Europe bad la leit rah nyngkong ia u sha kito ki ri na China ha kaba ki la rep ia une u jingthung la slem. Imat une u mih nyngkong ha China bad ha ki khap lum Himalaya. U **tartaricum** pat imat u mih nyngkong ha ki lum Himalaya. Une u kham jrong ban ia utei u **esculentum**, hynrei ki sla ki kham rit, ki syntiew ki kham rit. U **Str George Walt** u ong ba u **tartaricum** u long u jingbam uba kham bha ban ia u **esculentum**, namar u don kham bun ka umphniang bad kham khyndiat ki ksai kiba kham eh ban tylliat.

U kew Nepal u long u jingbam uba bha shibun na ka bynta



ka met u briew. Ynda la tylliat ia u symbai jongu, u ata uba ioh na u u long syriem ia u ata uba ioh na u kew, u kham lieh ruh palat ban ia u ata na u kew. Haba twad ia u ata jong u ruh lah ban sngewthuh na ka jingghli jong u. Ia u stait (**middlinge**) uba ioh na u ruh lah ban ai ia ki masi khem dud, namar u long u jingbam uba bha na ka bynta jong ki.

U kew Nepal u long u jingthung uba lah ban jrong kumba 3 phut, bad uba don shibun ki tnat. Ki syntiew ki don ka rong kaba lieh, hynrei kaba la suit rong da kaba saw. Ka lyngkha u kew Nepal ka long ka ba itynnad ban peit na ka bynta kine ki syntiew kiba itynnad. U symboh kew Nepal u long kum ka khoh kaba lai dong bad uba lieh bthuh ne iong ka rong. Ki sla ki long ka dur dohnud bad ki jrong kumba ar inshi haduh saw inshi bad kiba snoh ha u jyntang sla uba jrong ruh kumba shi inshi haduh saw inshi. Ki sla jong u tartaricum ki kham nep ban ia u nam pliang.

U kew nepal u long bha ha ka jaka kaba kham khriat bad kaba sngem. Lada ka bneng ka kham shit ha ka por ba u dang san kam pher eh, hynrei ha ka por ba u puh syntiew ka long kaba sniew eh ia u. Une u jingthung u lah ban met tang hapdeng 8 ne 10 taiew. U lah ruh ban long ha ki jaka jrong naduh 4000 phut haduh 14000 phut. U lah ruh ban long ha ki ba bun jait ki khyndew tangba u kham long bha ha ki khyndew kiba sbur bha lane wat ha ki dew shrah lada ka don bun ka sboh pyut jong ki jingthung (**humus**). Lada sboh eh ka khyndew une u jingthung u lah ban kyllon (**lodge**) ynda u la san bha. Namar ba u long bha wat ha ki khyndew kiba duna ka sboh, la ju khot ia u, u jingthung jong ki nongrep kiba duk. Une u jingthung um lah shah ia u thah.

Ia une u jingthung lah ban thung haba kut u June lane haba sdang u July. Ynda puh bha ia ka lyngkha bad la weng ia ki nuit ki nier baroh ki sa bet ia u symbai ha i nur rit i ba lah ban puid da ka lyngkor desi, lane lah ban shu ber ha ka khyndew bad hadien kata sa tap ia u symbai da kaba ring ka kynja kor kaba ki khot ha ka ktien phareng ka **harrow**. Lah ban thung kumba 5 tin umphniang sharak u symbai ha ka shi hektar. Kane ka pynmih pat arphew shah u symbai.

Ia une u jingthung ki ju thung khnang ban pynbha ia ka khyndew. La um dei na ka iing kur ki dai bad kiwei kiwei ki jingthung ba lah ban pynroi ia ka naitrojen, hynrei namar ba u lah ban shim jingbam da kaba jem na ka khyndew kaba sniew bad, ynda u la pyut une u jingthung, kane ka jingbam ka lah ban long pat ka jingbam ia kiwei ki jingthung kiba bud ia u. Nalor kata, namar ba u tap bha ia ka khyndew u kham pynlong sbur ia ka khyndew ynda la ot ia u.

## LYNNONG 21

### PYRETHRUM

Une u jingthung u la poi dang shen eh sha kane ka ri lum Khasi- Jaintia jong ngi. U long u jingthung uba donkam eh ha ki por thma namar ba ki pyndonkam ia u ban pyniap bun jaid ki khniang kiba dait ia ki shipai haba ki leit ia ka khlaw ka btap ka riat ka ram. Hynrei u long ruh u jingthung uba ki pyndonkam ban pyniap ia ki khniang kiba bam ia ki jingthung bad kiba dait ia ki jingri kum ki masi, ki kulai bad ki syiar. Na u syntiew jong u lah ban shna pawdar ban pyniap ia ki khniang kiba dait ia u brieve lane kiba par ia ka iing ka sem. lane ban pyniap ia ki khniang kiba bam ia ki dieng soh, ki jhur bad kiwei kiwei bad kiba diat ia ki jingri baroh. Na ka sla bad u jyntang pat ki shna ia ki prew kiba rit kiba lah ban thung ha iing ha sem khnang ban pyniap ia ki khniang kum ia u 'kain pyrjong bad kiwei kiwei ki khniang. Nga la pyni ha ka lynnong shaphang u phan ba ka dawai kaba ki ioh na une u jingthung ka long kaba lah ban pyndonkam ban pyniap ia ka niangpulit kaba bam ia u phan. Ha ki katto katne ki jaka ha Africa ki la pyndonkam ia u pawdar jong une u jingthung ban pyniap wat ia ki khniang kiba bam ia u dieng bad ki sla kopphi. Uwei I Mr. Le Pelley u la shim ka umphniang sharak kaba bha (**of a high flash point**) bad u la theh ia ka suki suki halor u pawdar pyrethrum kum ban jiar ia ka, nangta u sa pyndonkam ia ka ban synreit hapoh ka jain kaba tap ia u dieng kopphi khnang ban pyniap ia ki khniang kiba pynjulor ia u. Lada pyndonkam da ka umphniang sharak kaba sniew ka lah ban pyniap ia ki sla.

U pyrethrum u long u jingthung uba itynnad, lah ban thung ia u kum u syntiew ruh. Une u iadei kur jan eh bad u syntiew *Crysanthemum*. Ka kyrteng saians jong u ruh ka long ***Chrysanthemum roseum*** bad ***Chrysanthemum cinerariaefolium***, ki ar jaid ki pyrethrum kiba ki ju rep. La khot roseum ia utei uba nyngkong namar u don ki syntiew

kiba saw, uba ar pát u don ki syntiew kiba lieh. Une uba ar imat u kham bha ban ia uba nyngkong. U pyrethrum u lah ban jrong haduh kumba shi phut shiteng ne.

U pyrethrum u long bha ha ki jaka kiba khriat bad ha kiba jrong palat ia ka 4500 phut halor ka sla duriaw. Kata um long ha ka ri War ri Bhoi lane ha ki thor. U long u jingthung uba ki thung bha ha Japan. Ki kham rep pyrethrum ruh ha Kenya (Africa) ha ki lum jong kata ka jaka. Hangne ha ri India ruh ki la kham rep bha ia une u jingthung ha Kashmir bad kiwei kiwei ki jaka lum jong kane ka ri. Une u jingthung u long ha ki khyndew ki bym da sboh eh. U lah ruh ban long hajan poh ki dieng kum ki dieng soh peach lane wat ki dieng kseh ruh. Lada ka khyndew ka long kaba sboh eh ki lah ban kham duna hynrei ki sla kin kham bun.

Ia une u jingthung lah ban thung na u symbai lane da ki khun kiba lah ban pyniakhlad na u tynrai kmie. Imat ka kham bha bad kham stet ruh ban pynroi da kaba thung da ki khun kiba shu pyniakhlad na u kmie. Lada thung da u symbai lah ban thung ha u bnai March-April lane ha u bnai September-October. Ha ri Khasi imat ka kham bha ban thung ha u bnai March. U symbai u leit kumba shiteng kilo ha ka shi ekar. Shuwa ban thung ki da pdem ia u symbai hapoh um katto katne kynta. Hadien kata ki song ia u ha ka byrni bad ki tep hapoh khyndew kumba 4 ne 5 sngi. Hadien kata pat ki sa khleh bad ka khyndew bad ki sa ber ha ha jaka sara. Ia ki sara lah ban pynkynriah sha ka lyngkha ha u bnai April-May-June. Ha lyngkha ki thung ha ka jingjingai kumba shi phut shiteng uwei na uwei. Ha ri Khasi-Jaintia une u jingthung u lah ban long khlem da ai um (irrigate), kata tang ka um slap ka la biang. Ynda kumba lai bnai ne ki syntiew ki la sdang ban plie, kata ka por ban kheit ia ki syntiew ka la poi. Lada ym kheit ia ki ha ka por ba biang kata ka jingmih ruh ka duna bad ka jingbha jong u syntiew na ka bynta ban shna dawai ruh ka duna. Lah ban ioh haduh kumba 200 kilo u syntiew na ka shi ekar. Ynda la lah kheit ia ki syntiew ki thad pynrkhiang ha ka sngi bad ki sa die ia ki tang shu lah pynrkhiang.

## LYNNONG 22

### U SOHNIAMTRA, U SOHMYNDONG, BAD KIWEI KIWEI KI SOH-JEW KI SOH-THIANG.

Ha kane ka lynnong ngan thoh shaphang u sohniamtra, u sohmyndong bad kiwei kiwei ki soh kiba iadei kur bad ki, bad kiba la khot lang ha ka ktien phareng ki **citrus fruits** (kynnoh sitros phrut). Kine ki jaid soh imat ki mih nyngkong nyngshap ha kane ka ri India. U Professor Tanaka, u Japanese uba tip bha shaphang kine ki jaid soh, u ong ba kine ki jaid soh baroh ki mih nyngkong nyngshap ha Riwar jong ka ri Khasi-Jaintia bad nangne ki sa phriang kylleng ka pyrthei. Ka jingbun jong kine ki jaid ha ri War jong ngi imat ka long ka sakhi kaba khlain bha ba kine ki jaid soh ki lah kumta ban mih ha ki ri them jong ka ri Khasi Jaintia. Ngi don ha ri war u sohniamtra, u sohmyndong, u sohnairiang, u sohkwiit, u sohkhylah, u sohmyngngor, u sohpai, u sohma, u sohsyiem, u sohsying, u sohlong bad kiwei kiwei kiba ka pyrthei shabar ka ri Khasi kim pat tip. Ka pyrthei ka dang ap ia u riewstad lehse na ri Khasi, uba lah ban wad kham bniah ia kine ki soh bad u ban pynithuh ia ki sha kiwei pat ki jaidbynriew jong ka pyrthei.

Ki ri jong ka pyrthei kiba kham thung bha ia kine ki jaid soh ki long kine: ka ri America, ka Brazil (South America), ka Spain, ka Italy, ka China, ka Japan, ka India bad ka ri Israel. Na kitei ki jaid soh baroh kiba nga la jer kyrteng hangne, uba ki kham thung eh ha kitei ki ri jong ka pyrthei u long sohniamtra. Uba bud pat ia u sohniamtra u long uba ki khot ha ka ktien phareng u **grape fruit**. Une u syriem eh ia u sohkhylah. Imat u la mih kumno- re-kumno na utei, bad ynda hadien u la leit poi sha America ha kaba ki la pynroi bad bam bha ia u, bad mynta u la phriang kylleng ka pyrthei, bad lehse ka jingwan jong u mynta sha ri India ka long ka jingwan kylla biang sha la

iing. Uwei pat uba ki kham rep na kitei ki jaid soh u long u sohmyndong.

## U Sohniamtra

Don ar, lai jaid ki soh kiba ki khot ha ka ktien phareng **orange** bad iakaba la kylla Khasi u sohniamtra. Uwei na kitei ki jaid u long uba ngi ju thung ha ri Khasi, uba don ka snep ka bym da iadiat eh bad ki symboh kiba don hapoh u soh. Ia une ki khot u sohniamtra mandarin (**Mandarin orange**), hynrei ka kyrteng saians jong u ka long **Citrus reticulata**. Uwei pat u sohniamtra uba ngi shem ha California (America) bad kiwei kiwei ki jaka u long uba don ka snep kaba diat bha ha u symboh, bad ka long kaba shitom ban khoh ia ka snep jong u. Ia une ki khot ha ka ktien phareng 'sweet orange' lane u sohniamtra thaing khnang ban pyniapher ia u na uwei pat u sohniamtra uba jew (**Citrus aurantifolia**) bad ki khot ruh ia u **Citrus sinensis** namar ba lehse ki ngeit ba u mih nyngkong ha China. Na utei uba ki khot u sohniamtra thiang, don katto katne jait (**variety**) ha kane ka ri India jong ngi, u Malta, u Mosambi, u Val, u Sathgudi, bad u Batava. Ha u sohniamtra mandarin pat don katto katne ki jait (variety) hynrei kine kim da iapher eh kumba iapher ki variety jong u tei u sohniamtra thiang. Ki variety jong u mandarin uba ki khot ruh u **King orange** kiba don ha ri India ki long kine, **Nagpuri**, **Khasi**, **Darjeeling**, **Kamala** bad **Coorg**. Kine baroh ki long kiba thiang bha, bad ka kyrteng **sweet orange** lane u sohniamtra thiang ia utei uwei pat imat kam da long kaba iadei eh.

U sohniamtra u long ha ki bun jaid ki khyndew lait sa tang ha kito kiba shyiap eh lane ha ki dew byrtha. Kim long ruh ha ki jaka ha kiba ka um ka neh slem. Ha ki jaka madan ha kaba ka um ka neh slem dei ban da shna da ki nur pateng pateng ha ka jingjingai kumba 35 ne 40 phut na kawei ka nur ha kawei pat khnang ba ka um kan ym neh slem, ha kjat jong ki diengsoh. Ha ki jaka riat pat ha kiba ka um ka tuid shar shar, lynda ki diengsoh ki lah ban ioh um kaba biang ha ki bnai November haduh March, kata ka bri soh ka lah ban duh baroh kawei. Ha kum kine ki jait khyndew ka dei ban long kaba khleh dew byrtha

bad ka dei ban don kham bun ki sla pyut bad ki dieng ki siej ba la pyut bha (**dead organic matter**). Kaba kham bha eh ha ki jaka riat kum kita ka long ban shna ki kyrdon (**terrace**) lane ban pynmadan bha tang ha ka jaka ha kaba yn thung ia u diengsoh bad ban iehnoh ia u phlang lane ki nuit ki nier sawdong jong u, khnang ba ka khyndew kan ym tuid lehnohei bad kan bat ruh ia ka um slap. Lada buh da ki maw shaphang ba sharing ruh kan iarap shibun ban pynneh ia ka sbob bad ia ka um.

Ia u sohniamtra dei ban thung nyngkong ha ki jaka sara. Kane ka dei ban long ka jaka kaba sngem bad kaba dei sngi malu mala, bad kaba sbob bha ruh. Ynda ka bneng ka la sdang ban shit bad ynda ka la sdang slap dei ban puh bad ban da kynroi bha ia ka jaka. Nangta pat sa ber ia ki symbai bad sa tep pat malu mala da ka khyndew kaba sbob na jrong. Lada ka jaka ka long kaba sngem lehse ym da donkam ban ai um ei ei, hynrei lada kam da sngem bha kata dei ban ai um (irrigate). Ia kane ka jaka lah ban da tap da u kynja phlang kum u lynnai lane u kdait khnang ba ka jaka kan shong sngem, hynrei u dei ban ioh ruh katto katne ka sngi. Ha badei badei ia une u phlang ki da kynrong ha jrong kum ka kyndun. Lada leh kumne ruh ka kyndun ka dei ban stang bha ka jingsop khnang ba ki kjat sngi ki lah ban shoh ia ka khyndew teng teng. Kane ka pyniap ia ki katto katne ki jingpang kiba lah ban pyniap ia u sara kiba dang lung. Haba don kum kito ki jingpang ki tap ia ka khyndew da u shyiap uba narud wah, namar une u kham rkhiang, ynda ki sara ki la kham heh, ki leit rah ia ki ha kawei pat ka jaka ha kaba ki ieh ia ki haduh shisnem lane ar snem bad nangta pat ki sa leit rhung sha ka bri soh.

Ha kiwei pat ki ri jong ka pyrthei bad mynta wat ha Assam ruh kim ju thung beit da u shyieng uba ki ioh na u sohniamtra. Hynrei ki shu bod (**bud**) ha uwei pat u diengsoh uba iadei kur bad u sohniamtra lane ha uwei pat u sohniamtra. Uta u dieng u dei ban long uba na ka jaid kaba pynmih ki thied kiba khain bad uba iadei kur bad u sohniamtra kum u sohmyndong, sohnairiang, sohkuit bad kiwei kiwei de. Ngan sa batai kham

bha ia kane hadien. Haba ngi shu bod (bud) kata ngi dei ban thung ha ki jaka sara (**nursery**) ym da ki symbai jong u sohniamtra uba ngi kwah ban thung ha bri hynrei da u symbai jong uno uno uwei pat u diengsoh ha uba ngi kwah ban bod. Katkum kaba mih na ka jingtohkit bad ka jingpyrshang jong u Dr. Nandi bad u Mr. Bhattacharya ha ka **Citrus Research Station** kaba ha Byrnihat, ki la shem ba u diengsoh (**soheyng**) uba ki khot ha ka ktien Bangalee **Pani Jamir** (**Citrus limonta variety limetta**) u long imat uba bha tam katkum ka jingheh bad jingsan jong u ha ka jaka sara. Kim pat lah ban rai kut lada une u long shisha uba bha tam bad la un iaineh uba bha tam shirta. Uwei pat u jaid soh uba ki la shem ba u long uba bit ban bod u long u sohmyndong Khasi (**Citrus jambhiri**). Utei u Pani Jamir ruh u long u sohmyndong tang ba u iapher na u sohmyndong Khasi, namar ba u long uba lytuin ka dur (**oblong**), bad u long u bym da jew eh kum u sohmyndong Khasi (**rough lemon**). U sohnairiang ruh u lah ban long uba bit eh ban bod. Kumta ha ka jaka ban sara da u sohniamtra ka bha pynban ban sara da ki sohmyndong lane da u sohnairiang, bad ynda bod ha kine da u sohniamtra uba ngi la jied, u soh uba ngin ioh un long u sohniamtra, hynrei ki thied ki jaw kiba hapoh khyndew kin long ki jong u sohmyndong lane u sohnairiang.

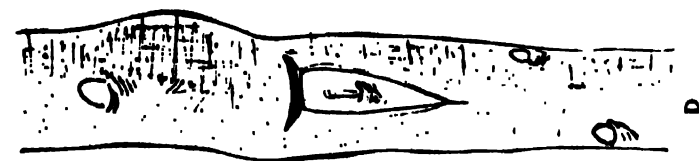
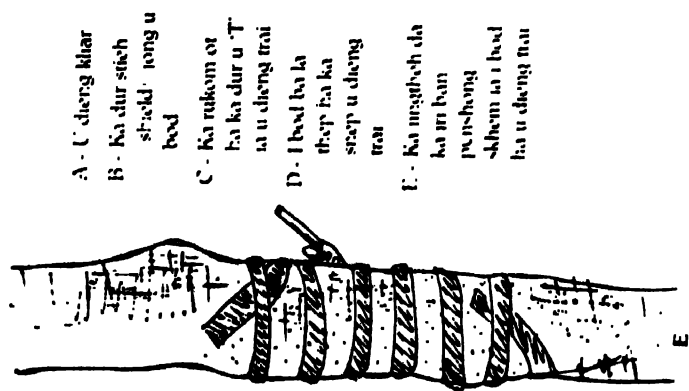
Ha ki jaka ha kiba ka long kaba shitom ia ki sara ban long ki ju thung ia ki symbai jong kine ki soh ha ki khiew khyndew. Ia kine ki khiew khyndew ki pyndap bha da ka khyndew kaba sboh kaba don shibun ka sboh jong ki sla dieng kiba la pyut (**leaf-mould**), bad hadien kata ki sa thung ia ki symbai bad ki sa ai um. Ia ki khiew ki buh hapoh ka ing dara bad ki ai um man ka la ka teng. Lada ki soh sara kim ioh sngi, ki lah ban stem ne kem pang. Kumta dei ban pynshah sngi ia ki hateng hateng. Ynda ki la kham heh ki sa leit thung ia ki ha ka jaka ha kaba kin buh haduh ba kin da dap kumba shisnem haduh ba ynda bod ia ki. Ia kane ka jaka ki khot ka **stock seedbed** ha ka ktien phareng. Ynda la bod ia ki, ki sa leit rah ia ki sha bri bad ki thung ia ki hangta. Ha ka **stockbed** ki thung ha ka



jingjingai kumba ar phut shiteng na uwei u lain ha uwei pat, bad kumba 16 inshi na uwei u dieng ha uwei pat u dieng ha u lain.

Shuwa ba ngan thoh shuh shuh shaphang u sohniamtra nga sngew dei ban da batai bha shaphang kaba bod (**budding**). Kane ka long syriem ia kaba krab (**grafting**), tangba ha ba krab ki pyndonkam da ka tnad, hynrei ha kaba bod ki pyndonkam tang da I shylluit tnad iba dang sdang ban mih. Ha kaba krab lane bod dei ban da jied shuwa ia u dieng trai (**stock**) bad ia u dieng kliar. U dieng trai. (stock) uba bit eh kumba nga la ong haneng imat u dei u somyndong. Ia u dieng kliar (scion) pat dei ban da jied sumar bha. Ki jied ia ki shylluit na ka bynta u dieng kliar na u dieng soh uba bha tam ha ka bri kumta ba u soh un long thik kum u jong uta na uba la shim ia kine ki shylluit.

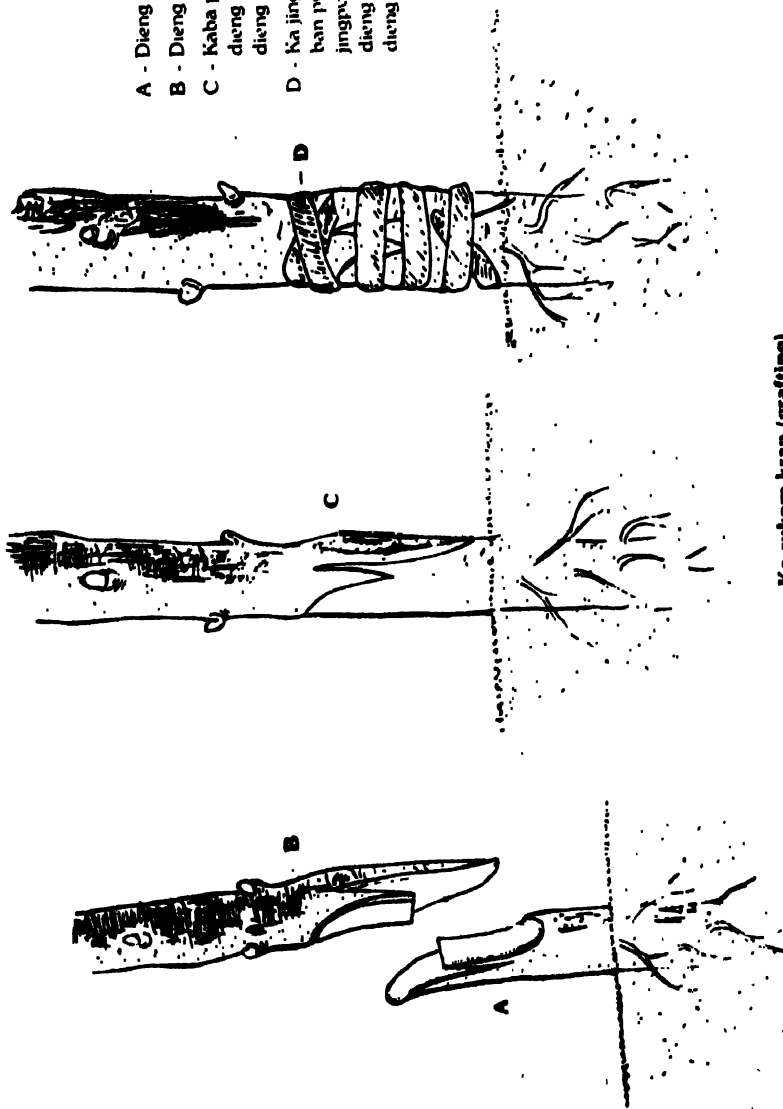
Kaba krab lane kaba bod ka long ban pyniasoh ar tylli ki dieng soh kiba iapher. U dieng trai uba don ki thied bad ka met kaba khlain bad u dieng kliar pat uba soh bha bad uba thiang. Lah ban pyniasoh ia ki lada ki thied kiba ha ka met jong u dieng kiba kit ia ka um bad ia ka jingbam jong u dieng ki lah ban iasoh, bad ka um ne i shylluit jong u dieng kliar. Kaba donkam eh namar kata ka long ban tip bad ban sngewthuh ia kane ka jingtrei ha kine ki dieng kiba ngi pyrshang ban pyniasoh. Kine ki thied kiba ha ka met u dieng kiba kit ia ka um bad ka jingbam jong u dieng ki don hapoh jong ka snep dieng bad ka dohmet. Kine ki thied (**conducting tissues**) ki long ban pyniasoh ia kine ki ksai haduh ba ka um bad ka jingbam na uwei u dieng ka iaid lyngba kine ki ksai sha uwei pat. Don bun ki rukom kiba ki leh khnang ban pyniasoh ia kine ki ksai da kaba bod, hynrei ngan batai hangne harum tang ia kaba ki khot kaba bod kum u 'T'. Ki khot ia ka kumne namar ba ki ot ha ka snep jong u dieng trai, kata u sohmýndong lane uno uno uwei pat u dieng trai uba ngi la jied, ia ka dur kaba kum u 'T'. Une u dieng trai u dei ban long uba kumba shisnem ka rta. Ia kane ka jingot lah ban ot ha ka jingjingai kumba 10 ne 12 inshi na ka khyndew. Hadien kata pat ki sa pied ia ka snep bad ki sa thep ia i shylluit na u dieng kliar. Ia



- A - U dieng khar  
B - Ka dur stieh  
shack - tong u  
bed  
C - Ka rukom or  
ka ka dur u - T  
at u dieng trai  
D - I bed ka ka  
thep ka ka  
srap u dieng  
trai  
E - Ka ngith da  
ka ri ban  
penhong  
shem at i bed  
ka u dieng nau

Shield Lane T-Budding

- A - Dieng Trai
- B - Dieng Nilar
- C - Kaba pyniadat lang u  
dieng kiar bad u  
dieng trai
- D - Ka jingtoh da ka jin  
ban pynskhem ia ka  
jingpynua snoh u  
dieng kiar bad u  
dieng trai



Ka rukom krap (grafting)

ine i shylluit ki shim na i tnat iba rit bad iba i khlain bha bad ki ot stang ia i ha ka dur jong ka stieh, bad ki sa thep klok ha itei i shyntur iba la plie jong u dieng trai. Ynda la lah thep bha ia i, ki sa teh da u sainalia ban pynskhem ia i hangta, bad sa sop da ka plastik. Ka por kaba bha eh ban bod ha ri Khasi-Jaintia imat ka long naduh u bnai March haduh u bnai July. Kaba bod kam long kaba eh hynrei ka donkam katto katne ka jingmlien (**experience**). Lada bod shibun ki diengsoh, donkam ban ioh ka tari kaba thikna na ka bynta kane ka kam (**budding knife**). Ha kylleng ka pyrthei kane ka long ka rukom kaba ki leh na ka bynta ki bri sohniamtra baroh. Nalor kata ki dieng soh kiba la bod kumtei ki pynmih ki soh kiba kham bha. Ki kham soh kloiruh shibun ban ia ki diengsoh kiba ki shu bet da ki symbai. Ka daw balei ba ki nongrep ha Khasi-Jaintia kim ju bod, ka long namar ba u sohniamtra Khasi u lah ban pynmih ki khun na u symbai kiba shu mih beit na ka kmie (**polyembryonic**) bad ba kim pat nang ia kane ka rukom pynkha. Ka ba lai pat ka daw ka long namar ba ka rukom sumar bri kam pat biang.

Ynda i shylluit i la iasoh bad u dieng trai, dei ban ot noh ia ka kliar jong u dieng trai. Haden katto katne sngi pat ki shylluit jongu trai ki lah ban ia mih ryngkat bad i shylluit jong u dieng kliar, kumta ia ki shylluit jong u diengtrai baroh dei ban khyllad noh bad ban iehnoh tang ia ka tnat kaba mih na i shylluit jong u dieng kliar. Ynda u dieng soh uba la bod kumne u la bit ban leit thung sha bri, dei ban pynkhreh ia ka thliew ha ka bri ha ka ban sa leit thung ia u. Nga la thoh haneng bad nga sngew dei ban pyni hangne ba shuwa ban tih ia kine ki thliew dei ban da tip katno ka khyndew ka jylliew. Na ka bynta u dieng sohniamtra nga ngeit ba ka khyndew kam dei ban ~~dua~~ <sup>dua</sup> ia ka 6 phut ka jingjylliew. Lada baroh kane ka 6 phut ka don ka um, kumba ngi ju shem shaphang ri dkhar, kata ka bri soh ka lah ban duh hadien katto katne snem. Lada ka khyndew hapoh kane ka 6 phut ka long ka dew shyiap, kata ruh kam long kaba bha ia ka jaka ha ka ban thung ia ka bri ksoh, donkam ban da thew bha ia ka jingjingai ha kaba dei ba thung ia ki diensoh. Ha ri Khasi-Jaintia ki iathung jan eh ia ki diengsoh. Kane ka jingjingai ka

lah ban ia pher katkum ka jait (variety) jong u diengsoh, hynrei nga ngeit ba ia u dieng sohniamtra ha ri Khasi-Jaintia ym dei ban thung kham jan ban ia ka 16 phut uwei na uwei pat. Ha bun ki ri jong ka pyrthei ki ong ba ka jingingai kumba 20 phut ka long kaba bha na ka bynta u sohniamtra. Haba thung ha ki lain pat lah ban thung ia ki ha ka rukom kaba ki ong ha ka ktien phareng **equilateral system**, kata ka jingingai jong uwei u dieng ha uwei pat u dieng, ha ka bri soh baroh kawei ka long kat juh.

Ynda lah tih ia ka thliew ha ka ban thung ia u diengsoh ki sa leit rah ia kitei ki diengsoh kiba la bod ban thung ia ki. Ka kham bha ruh ban tih lypa katto katne sngi ia ki thliew shuwa ban thung ia ki, bad ban buh sboh eit masi ha kine ki thliew. Ia kitei ki diengsoh donkam ruh ban sa sop bha ia ki thied da ka khyndew kum ka ball khnang ba ki thied rit kin ym rkhiang da kaba pynshah ia ki ha ka sngi bad ka lyer. Lada ka khyndew ka don ka jingsngem kaba biang um donkam ban leh ei ei shuh ynda la thung ia u, bad u dieng un sa san. Katba u dang san donkam ban ioh ia ka jingbam kaba biang. Lah ban ai da ka sboh eit masi lane da kano kano ka sboh lane lah ban thung ha ka bri ia u kynja jingthung uba tap lut ia ki nuit ki nier bad ia ka khyndew, bad uba lah ban ai sboh ia ka. U rymbai ja u long uwei uba ngi ngeit uba bit eh ban thung kumne. U saihon (sunnhemp) ruh u long uba iadei ban thung ha ki bun ki jaka ha ri Khasi-jaintia. Ka shyieng ruh, lada ioh tad, ka long kaba bha ban ai. Ha ki katto katne ki jaka ka shun ruh ka lah ban long kaba myntoi, khamtam ha ki jaka ha kiba la shem ba ka khyndew ka long kaba bun eh ka rmi (acid). Don bun ki jaka ha ri Assam ki ba long kumta, khamtam ha ki jaka kiba kham sngem bad kiba ka um ka kham neh slem.

Don katto katne ki diengsoh, kiba lada ngor ia ki, ki kham seisoh shibun, hynrei u dieng sohniamtra imat um donkam ban da ngor. La katta ruh don ki tnat kiba mih na trai u dieng kiba san sted katta katta ba ha pdeng shisnem ki lah ban jrong palat ia u dieng kmie. Ia kine ki tnat lung (water suckers) dei ban khelai noh lane ban ot sumar da ka khanshi kaba ki ju thaw

kh nang na ka bynta kane. Kine ki tnat kim ju soh, hynrei ki shu shim lehnohei ia ka jingbam kaba dei ban leit sha u kmie.

### Ki Khniang Sohniamtra

U Sohniamtra u don katto katne ki khniang kiba pynshitom ia u, hynrei kiba kham pynshitom eh ia u imat ki dei kine (i) u niangpongthliew ka met bah (**citrus trunk borer**), (ii) u niangpongthliew ia ki tnat (**citrus shoot borer**), bad ka niangksem sitros kaba jyrngam (**citrus green bug**), ka niangshun (**common-mealy bug**) u niangkrangbamsla (**citrus leaf miner**), bad u naingniuh ka thapbalieh sohmyndong.

U niangpongthliew ia ka met bah (**Chloridolum alcamena**) u long u khniang miaw (a kind of beetle) uba kumba shi inshi pawa ka jingjrong bad kumba shiteng inshi ka jingiar ka met. Ki thapniang ki long kiba liehbthuh (grey) bad kiba thoh dak iong. Ki tmain ki long kiba jrong palat ia ka met jong u. Ka khniang ka kha pylleng ha kjat jong u dieng. Hadien katto katne sngi ki niangbyrnai kiba rit ki mih na kine ki pylleng bad ki sdang ban bam nyngkong ia ka snep dieng. Hadien katto katne sngi ki sa ksam ia ki dohmet bad ki da kyndat shabar jong u dieng ia u shaba. Lah ban kham pynduna ia une u khniang da kaba pushara da ka shun ia u dieng haduh lai phut na ka khyndew.

U naingpongthliew ia ki tnat (**Chortdolum cinctum**) ruh u long uba iasyriem ia utei u khniang ba lah batai haneng, tang ba u kham rit ban ia u. Ka met jong u ruh ka kham iong (dark brown or steel blue). Lah ban khampynduna ia une u khniang da kaba ngor noh ia ki tnat baroh kiba iap bad ban thang ia ki, lane lah ban khlaw ia ki na ka thliew jong ki tnat dieng da u sainar, lane lah ban kynshait shapoh ki thliew da ka petrol lane ka umphnaing sharak kaba ka khleh um.

U niangksem jyrngam (**Rhynchocoris humeralis**) kaba ki khot ha ka ktien phiareng **citrus shield bug** ka long ka khniang kaba kjit ia ka um jong u soh. Kane ka khniang ka hynrei bha eh ha u bnai June bad u bnai July ha ka por ba u sohniamtra u la heh kat u marbel (marble) hynrei ka long kaba

kham eh ban lohi ia ka namar ka jyrngam. Ynda kane ka khniang ka kjit ia ka um jong u soh, kata u sa kylla stem bad u sa hap. Lah ban pyniap ia kane ka khniang da kaba synreit da ka dawai pyniap khniang bapher bapher.

Ka niang shun lane ka khniang phuleng (*Pseudococcus citriculus*) kaba ki khot ha ka ktien phareng **mealy bug** ka long kawei pat ka khniang kaba pynjutor shibun ia u sohniamtra ha ri Khasi-Jaintia. Kane ka khniang ka jrong tang kumba shiteng inshi bad ka pyngkiang jong ka pat ka long tang kumba shi pawa inshi, bad ka met jong ka baroh kawei ka long kumba tap da ka shun lane da u pawdar lieh. Kam don thapniang hynrei ka shu par da ka kjat bad ka kiew ia ki tnat jong ki dieng ha ki kynhun. Ka pynjutor ia ki dieng da ka ba kjit ia ka um na ka snep jong ki dieng soh. Lah ban pynduna ia kane ruh da kaba kynshait da katei ka dawai ba la shna na ka umphniang sharak bad ka sabon.

U niangbamsla (*Phyllocnistis citrella*) uba ki khot ha ka ktien phareng (**citrus leaf miner**) u long u niangniuh uba rit bad uba lieh ka rong, uba pong thliw ha ki sla jong u dieng sohniamtra, u dieng sohmyndong bad kiwei kiwei. Ki sla kiba don une u khniang ki don ka krem kiba dor kum u bsein hapoh ka snep jong ka sla (**epidirmis**) bad habadei kine ki sla ki kli bad ki sa tlor, bad hadien kata ki sa hap. Une u niangniuh u long u khun (larva) jong ka thapbalong kaba rit kaba bthuh. Imat ha ki katto katne ki jaka ha ri Khasi ki khot ia une u khniang u "niangsdie" lane u 'niangstein'. Namar ba u shong hapdeng ki ar tylli ki snep sla bad u don kumta hapoh ka sla namarkata, ym lah ban pyniap ia u da ki kynja dawai kiba shu synreit ia ka sla. Hynrei lah ban pyndonkam da ki kynja dawai khiang kiba ngam shapoh ka met u dieng (**systemic insecticides**).

Don ruh katto katne ki niangniuh kiba bam ia ki sla jong u dieng sohniamtra ne sohmyndong, hynrei u niangniuh jong ka thapbalieh kaba ki khot ka thapbalieh sohmyndong u long uba kham pynjutor. Ka thapbalieh sohmyndong (*Papilio demoleus*) ka long kaba heh kumba lai inshi naba kut kawei ka thapniang ha bakut kawei pat, bad ka don ka rong kaba

jyngam lam rong lyoh bad ki jingthoh kiba stem, bad ar tylli ki jongthoh kiba kum ki khmat ha ki thapniang kiba shadien. Kane ka thapbalieh ka kha pylleng kham bunsien ha ki diengsoh kiba dang lung. Na kine ki pylleng ki mih ki naingniuh hadien kumba saw ne san sngi, bad hapdeng ar ne lai ne saw taiew kila heh bna. Hadien kata ki sa kylla nainglong bad sa kylla thapbalieh. Lah ban kham pynduna iakine ki khniang da kaba tam ia ki naingniuh jong ki na ki sla, lane da kaba tam ia ki pylleng lada ithuh ia ki, lane da kaba kem ia ki thapbalieh ha ki tynsong lane da kaba synreit ia ki sla da ka dawai pyniap khiang.

### Ki Jingpang Sohniamtra

U dieng sohniamtra u don ruh bun jaid ki jingpang, hynrei kiba ju kham shem ha kane ka ri ki long kine : (i) ka pangiap tnat (*Coletotrichum gloeosporioides*) (ii) ka pangmih thit (*Phytophthora parasitica*). Ka pang iap imat, kaba ki khot ha ka ktien phareng **wither tip**, ka long ka jingpang kaba sdang na ki khmut jong ki tnat bad kaba par arsut arsut sharum. Ki sla ha kaba sdang kane ka jingpang, ki shu flor bad ki sa hap. Ynda ka jingpang ka la jur ka lah ban trei wat ia ki tnat kiba la heh ruh. Ka makariang kaba pynlong ia kane ka jingpang ka lah ban pur sha ki soh, kumta ba ki thoh pyut. Haba ki long kumne, ki phareng ki khot ia kane ka jingpang **anthracnose**. Kajuh ka mangkariang ka lah ruh ban pynhap ia ki syntiew. Lada kine ki syntiew ki hap ki don ki jingthoh dak kiba saw ha ki, kata ngi lah ban ngeit ba dei kabe ka juh ka jingpang kaba pynhap ia ki. Haba ki syntiew ki hap kumne ki phareng ki khot ia kane ka jingpang **bloom blight**. Kane ka juh ka mangkariang ka lah pat ban pynpaw jingpang tang ha ki sla. Ki sla kiba ioh ia kane ka jingpang ki thoh dak (spots) da kiba bthuh stem bad kiba pyllun. Ynda kine ki jingthoh ki la kham slem, lah ban iohi ha kita ki kynja met (substance) kiba rit bin bin bad kiba long kum ki dewiong. Ia kane ka jingpang haba ka paw tang ha ka sla kumne ki khot ha ka ktien phareng **leafspot**. Kane ka jingpang kam-ju da kham trei tyngah ha ki dieng kiba khlain bha. Kata lada ki dieng ki ioh ka jingbam



kaba biang na ka khyndew, kane ka jingpang kam lah ban da pynshitom eh. Kumta ngi ngeit ba kaba ai da ka sboh masi, lane da ka shyieng, lane da kine, baroh ar kan iarap ban pynduh ia kane ka jingpang. Imat ba ha Assam ki la shem ruh ba kaba ai da ka iron sulphate ruh ka iarap ia ki diengsoh kiba ioh ia kane ka jingpang. Ia kane ka dawai ki pynum ha ka um bad Jki sa theh ia ka hajan ki thied jong kine ki dieng kiba pang. Kaba synreit da ka bordeaux mixture ha ki tnat ruh ka iarap ia ki shibun. Ia kane ki khleh 3 bynta u tutia, lai bynta ka shun bad 50 bynta ka um. Lah ruh ban pyndonkam da ki dawai kiba la khleh lypa kiba ki khot ki **fungicide** ha ka ktien phareng. Hynrei kaba kham bha eh ka long ban ot noh ia ki tnat kiba iap bad ban thang ia ki. Nga ngeit ruh ba kaba jied ia u dieng trai ha ka por ban bet kan pynduna shibun ia kane ka jingpang.

Ka jingpang mih thit (*Phytophthora parasitica*) kaba ki khot ha ka ktien phareng **gummosis** ka long kawei pat ka jingpang ha u sohniamtra. Kane ka jingpang ka pynmih ka kynja thit (gum) hajan trai jong u dieng, bad ha badei badei ha ki thied bah. Khnang ban pynduna ia kane ka jingpang dei ban thung da ki diengtrai (stock) kiba kane ka jingpang kam nym ioh leh trai khlieh. Haba bod ruh dei ban bod ha ka jaka ha kaba u dieng u long kumba 8 inshi ne palat na ka khyndew; namar lada u slap u pynpashait da ka khyndew haduh ka jaka kaba la ot khnang ban bod, kata u dieng u lah ban ioh ia ka jingpang na ka khyndew. Kano kano ka jingthung ha u dieng ka iarap ia u ban kem ia ka jingpang. Kaba thung jylliew eh lane kaba kynton khyndew ia u dieng ka lah ruh ban iarap ia kane ka jingpang ban kiew ha u dieng. Kawei pat kaba lah ban leh ka long ban kyllan da ka dawai kaba ki khot bordeaux paste, kata da kaba khleh da u tutia bad ka shun bad da kaba shu ai um tang ban pynjem ia kane ka jingkhleh. Ka long barabor kaba bha ban leh kumne ia ki diengsoh kiba dangrit wat lada kim pat ioh ia kane ka jingpang.

### **Ka Jingkheit bad Die Soh**

U dieng sohnaimtra u shim por kumba 8 snem shuwa ba un soh bha, hynrei kumba nga la ong haneng, lada shu bod ia

u ka jingseisoh ka kham long kloi shibun. Ka jingsoh ha ri Khasi-Jaintia ka long shisien shi snem, hynrei ha ki katto katne ki jaka ha ri India ki lah ruh ban soh ar sien shisnem. Ki sohniamtra ha ri Khasi-Jaintia ki la sdang ban saw khmut naduh shiteng u bnai October, hynrei ka jingkhait soh kaba thikna ka long naduh u bnai December haduh u bnai february. Ka jingkhait soh ha ri Khasi-Jaintia haduh mynta ka dang long ha ka rukom kaba bieit bad kaba khlem akor. U Dr. Mitra, uba la long haduh u Director jong ka jingrep ha ka Jylla Assam, u ong ba kumba 30 haduh 40 ki soh na man la ka shispah ki shu lehnohei namar ba ki nongkhait ki kheit khlemakor, ha ka jinghap ba beh ka lyer bad na ka jingbymbiang ka rukom ban die ia ki. Ka rukom kaba bha eh ban kheit kaba ki ju leh ha kylleng ka pyrthei ka long ban pyndonkam da ka jingkieng, ka kynja khanshi (**clipper**) ban khap ia ka tnat kaba iasoh bad u soh najan tdong jong u, nangta sa thep ia ki ha ka pla. Ynda ka pla ka la dap sa hiar ban theh ia ki ha ka shang lane ha ka synduk. Kine ki shang bad ki synduk ki lah ban long kito ha kiba yn shalan ia u soh sha ki shnong kiba jngai. Lada phah ia ki ha u shang dei ban da sop bha ia uta u shang bad ban da tap da ka jingtap shang khnang ba ym don mano mano ban khlaw ia ki ha lynti. Kaba kham bha ka long ban leit rah ia u soh sha iing bad ban da jied (**grade**) ia ki katkum ia ki klas ki klas, katkum ka jingitynnad bad jingheh jingrit jong ki. Ia kine ki soh sa thep ha ki synduk dieng kiba sting bad lada lah ban ioh, ki da sop kyrpang ruh da ka kot sada stang (tissue paper) ia uwei uwei u soh. Lada leh kumne u lah ban sah slem bad ban leit jngai. Lada kheit sumar ha katei ka rukom lah ban buh slem ia u soh. Lah ruh ban buh ha ka jaka kaba khriat ha kaba ka jingshit ka long tang (40 degree Fahrenheit). Don mynta ki jaka buh soh ha ri India ha kiba ki pynhiar ia ka jingshit haduh 40 degree. Kane ka rukom buh soh ka donkam ia ka elektrik. Nga ngeit ba ka por kan ym slem ha kaba ki nongrep ha ri Khasi-jaintia ruh kin sa ioh kum kitei ki iing buh soh.

Ha ka jingpyrkhat jongnga, kaba donkam eh ia u nongrep soh ka long ka jingdie (**marketing**) ia u soh. Nga ngeit ba ka jingrep soh kan ym lah ban roi stet lynda ki nongrep soh ki lah

ban die ia u soh ha ka dor kaba pynmyntoi ia ki. Ka rukom die soh kumba ka long mynta ka long ka bym wallan jingmyntoi shibun ia u nongrep soh. Ki nongrep kiba sian ki dei ban ia synjuk lang ha kaba die ia u soh. Ha California ia u sohniamtra baroh ha kata ka jaka la die da ka jingialang kaba ki khot ka **California fruit Growers Association**. Ngi donkam kum kata ka jingialang ha ri Khasi-Jaintia ruh. Kane ka jingialang kan iarap ym tang ban die hynrei ban wad ia ki rukom thymmai ban rep soh bad ban kham pynroi ia ka jingmyntoi na iohnong. U Dr. Mitra u la thoh naduh ka snem 1928 ba ka por ka la poi ha ri Khasi-Jaintia ba ki la dei ban pynlong kum kata ka jingialang. Kane ka jingialang kan wad ruh ia ki buit bad kan hikai ruh kumno ban pyndonkam ia u sohniamtra, sohnairiang bad kiwei kiwei ki soh ban shna marmalade, lane **orange juice** lane **orange syrup**.

U sohniamtra u long uwei na ki soh uba bha eh na ka bynta ka met u briew bad ka jingkoit jingkhiah jong u. La ngi don shibun u sohniamtra ha ka ri Khasi-Jaintia jong ngi hynrei ka jingbam soh ka dang duna shibun. Kaba bam soh shuwa lane tang shu lah bam, ka long ka rukom kaba bha kaba ngi lah ban bud na ki nong America ne ki phareng.

### **U Soh-myndong (Limes and Lemons)**

Lait na u sohniamtra u sohmyndong u long uwei pat uba kham donkam ban ia kiweikiwei pat ki sohjew sohthiang (**citrus fruits**) kiba ngi thung bha ha ri Khasi. La katta ruh ka jingthung sohmyndong kam pat da long kaba biang haba ia nujor bad ka jingthung sohmyndong sha kiwei kiwei pat ki bynta jong ka ri India, bad haba peit ruh ia ka jingkhahi, namar ba u lah ban sah kham slem bad lah ban shalan ia u kham jngai ban ia u sohniamtra. Nga ngeit namarkata ba ka jingthung sohmyndong kan sa kham roi ha ki ri lum Khasi-Jaintia jong ngi.

Ha ka ri India imat don lai jaid ki sohmyndong kiba ki ju kham thung. Kita ki long kine harum: (i) u Sohmyndong rit (***Citrus aurantiifolia***) uba ki khot ha ka ktien phareng **lime** bad ha ka ktien Hindustani **kagzi nimbu**, (ii) u Sohmyndong jew (***Citrus limon***) uba ki khot ha ka ktien phareng **sour**

**lemon** bad ha ka ktien Hindustani **khatta** lane **pahari nimbu** bad (iii) u sohmyndong thiang (**Citurs limon-variety limona**) uba ki khot ha ka ktien phareng **sweet lemon** bad ha ka ktien Hindustani **mitha nimbu**.

U sohmyndong rit lane u **kagzi** u long u sohmyndong uba ngi shait shem eh ha iew ha hat ha kane ka ri India. Une u long u soh uba heh kumba 2 inshi ne duna, uba stang bha ka snep bad uba stem bha. Une u soh u long bha ha ki jaka ha kaba ka khyndew kam da shrah eh; bad um da donkam eh ka jingsumar kum kiwei kiwei pat ki sohjew sohthaing. Kaba phylla ka long ba ia une u soh haduh mynta ki nogntep ha ri Khasi-Jaintia, imat kim da suitniew eh ban rep ia u. Ia une u jait sohmyndong ki thung ha kylleng ki jaka ka ri India; hynrei na ki jylla kiba kham thung bha eh ia u, ka Tamil Nadu ka long kaba nyngkong. Ha kane ka jylla imat don ar jait kine ki sohmyndong, uwei uba kham shaltuin bad uba kham stang bha ka snep bad uba ki khot u kagzi nimbu" bad uwei pat uba pyllun bad uba ki khot u pati nimbu.

U sohmyndong jew imat u long uba kham heh ia utei haneng; ka snep ruh ka kham rben shibun bad ka kham soh ruh bad ka um ruh ka kham bun bad ka kham jew. Une u long u jait sohmyndong uba ngi ju kham shem ha ri Khasi-Jaintia bad ha kiwei kiwei ki jaka lum jong ka ri India, bad ha ki jaka thor ruh kum ha Agra bad Farrukhabad ha ka jylla Uttar Pradesh.

U sohmyndong thiang u long uba ki thung malu mala ha Tamil Nadu bad ha Punjab. Une u soh u long uba kham rit bad pyllun. Ka dohmet ka lieh bad ka bun bha ka um kaba thiang. Ha jylla Tamil Nadu ki thung ia une mymta ha kine ki distrik, Malabar, Salem bad Nilgiri. Ha Punjab ki thung ia une ha kine ki distrik Lyallpur bad Sheikhpura.

### **U Sohmyndong (California)**

U sohmyndong California (**Citrus paradisi**) uba ju khot ha ka ktien phareng **grape fruit** u long u soh uba dang wan shen sha kane ka ri na America. La khot ia u kumta namar ba u mih haduh lai saw ha ka shi rynjup kim ki soh grape. Une u

soh lehse u mih na u sohmyngngor ki dewlynnong West Indies. La ngeit ba u long u soh uba dang mih shen. U soh u ia syriem eh ia u soh khyllah, bad lehsi u dei tang uwei u jaid jong u. Kum u sohmyngngor pat u don ar jaid: (1) uba saw hoin (pink) ka dohmet bad (2) uba lam stem ka dohmet. Dang shen la wallam ia u sha kane ka ri India, bad u iadei bha ha Punjab bad ha Simla. Hynrei kat ha ki jaka kiba la pyrshang ia u ha kane ka ri, u long bha khlem jingshitom. Nga ngeit namarkata, ba une u dei ban long bha ha ri Khasi-Jaintia. Ki variety, kaba ki jaid jong une u soh kiba la poi sha ka ri ki long kine: Marsh's Seedless, Triumph, Duncan bad Fustar. Ka Allahabad Agricultural Institute ha Allahabad ruh ka thung bha ia une u soh bad u iaid bha ruh. U long u soh uba bang pyngngad shibun ban bam.

Kito kiba kwah ban ioh jingtip shuh shuh sha phang ki sohjew-sohthiang ki lah ban pynioh ia kine ki kot ba la aj kyrteng harum:

1. Hume. H.H. – The Cultivation of Citrus Fruits (The Macmillan Company, New York)
2. Fawcet, H.S. and Lee, H.A. Citrus Deseases and Their Control (Mc Graw-Hill Book Company, New York)
3. Quayle, H.J. – Insects of Citrus and other Subtropical Fruits (Comstock Publishing Company, Ithaca New York).
4. Report on Marketing of Citrus Fruits in India (Manager of Publications, Government of India Press).

**U SOHTRUN**

Une u soh imat u long uba wan nyngkong nyngshap na Brazil ha South America. Imat u la wan poi sha ri India ha ka snem 1548. Wat la um pat roi stet ha kane ka ri kumba u la roi ha kiwei pat ki ri, kum ha ri dewlynnong Hawaii, Malaysia, West Indies, South Africa bad Queensland, la kata ruh ngi shem ia u ha bun ki jaka ha kane ka ri India kum ha Tripura, Meghalaya, Assam, West Bengal, Malabar Coast bad ha ki rud duriaw jong ka Maharastra. Na kitei ki jaka baroh, ka Singapore, bad ki dewlynnong Hawaii ki long ki jaka kiba rep bha ia une u soh namar ba ki don ki karkhana kiba heh kiba thep ia une u soh ha ki tin bad kiba phah ia u sha kylleng ka pyrthei. Ka Meghalaya bad Assam baroh kawei ki long ki jaka kiba bit eh ban rep ia une u soh lada ki lah ban thep ia u kumta ha ki tin kumba ki leh sha kiwei pat ki jaka. Kane ka long kawei na ki industri (Industry) kaba ki Khasi-Pnar ki dei ban pynieng.

Une u soh u long ha ki jaka ki bym da shit eh, bad um da long bha satia ha ki jaka kiba khriat. Ka jingshit jong ka bneng kaba naduh 60 degree haduh 90 degree (Fahrenheit) imat ka long kaba ia dei bha na ka bynta une u soh. Dei na kata ka daw ba nga ngeit ba ki jaka ri War bad ri Bhoi jong ngi ki dei ban long kiba bit eh na ka bynta une u soh. Um lah ban shah ia ka jingshit eh jong ka sngi, hynrei um lah pat ban long bha lada kah eh ki dieng. Une u soh u lah ban long bha ha ki bun jaid ki khyndew, hynrei u iadei bha eh ha ka khyndew ka bym da shyiap eh lane ka bym da skhah eh. Imat kam da donkam ruh ba ka khyndew ka dei ban long kaba kaba sboh eh. Don kiba ngeit ba u soh uba na ka khyndew kaba sboh eh u long uba kham heh. Imat une u soh um da long bha eh ha ki jaka kiba duna ka nar bad kiba bun eh ka shun. Ka khyndew ka dei ruh ban long kato ha kaba ka um kam lah ban neh slem. Namarkata ki jaka sharing ki lah ban long kiba kham bha.

Ia u sohtrun ki thung na ki shylluit (**ratoons or suckers**) kiba mih najan ki thied hapoh khyndew. Lane na ki tnat lung (**suckers**) kiba mih ha khap ki sla (**axile**) bad u met bah. Lane na ki shylluit (**slips**) kiba mih na ka met bah kaba bah khun (**fruiting stem**) najan trai u soh lane na ki shylluit kiba mih narud u kliar, lane na ka kliar hi jong u soh. Na kitei ki saw jaid kiba ngi lah ban pyndonkam ha kaba thung, ki shylluit najan ki thied bad ki tnat lung ki long kham bha eh namar ki lah ban pynmih soh kham kloi, tang kumba shi snem shiteng, hynrei ki shylluit pat ki shim por kumba ar snem. La katta ruh ki ju pyndonkam ia ki shylluit namar ki pynmih ki soh kiba kham heh ha kaba ki dang mih nyngkong.

Ka rukom kaba thymmai kaba ki leh ha Trinidad khnang ban pynmih kloi ia kine ki shylluit ka long kumne: Ia ki met bah kiba iaw ki ot pyngkiang pyngkiang bad ki pynlong ki lyngkniap kiba kumba shi pawa inshi ka jingstang bad ia kine ki khlai noh ia ki sla baroh. Nangta pat ki buh ia ki kumba san minit ha ka **potassium permagnate** kaba la khleh shibun bad ka um (**5 percent solution**), bad ki sa pynrkhiang ia ki. Ynda kumba shi bnai ki shylluit ki sdang ban mih, bad ynda ki la dap kumba ar bnai ki sa leit thung ia ki sha bri.

Ka rukom thung sohtrun ka iapher shibun ha ki jaka jaka; hynrei imat kaba kham bit ia ki jaka kiba kham madan ha ri Khasi-Jaintia ka long lehse ban thung ia ki ha ki lynter lynter kiba ia jngai kumba ar phut na kawei ka lynter sha kawei pat, bad hadien kata pat ka jingjingai jong kine ki ar syrtap ki lynter ka lah ban long kumba saw phut na kiwei pat ki ar syrtap. Ka jingjingai na uwei u dieng sohtrun ha uwei pat ha ki lynter ka long kumba ar phut. Haba leh kumne kito ki dieng sohtrun kiba ha ki lynter kiba marjan ki ia kyrshan uwei ia uwei pat bad ki soh ha ki kim da shah shoh sngi eh. Lada thung pat haduh lai ki lynter kiba marjan katta ka lynter kaba hapdeng kam da ioh sngi kaba biang. Ka jingjan ne jingjingai jong uwei u dieng sohtrun na uwei pat ka shong eh ha ka rukom rep sohtrun ha kata ka jaka; kata katkum ka jingbun ki snem ba u nongrep u mut ban iehnoh ia ka bri ba kan seisoh. Ha ki katto

katne ki ri ki ju iehnoh haduh kumba 10 ne 12 snem; ha kiwei pat ki ri ki iehnoh tang lai ne saw snem. Ha ki bun ki jaka ha Assam imat ki iehnoh tang kumba 5 ne 6 snem. Hynrei don ki jaka ha ri Khasi-Jaintia ha kiba ki iehnoh haduh 30 snem.

Shuwa ban thung ia kitei ki shylluit najan ki thied lane ki mat lung lane ki shylluit, dei ban da puh ne lur bah ia ka bri, kumba ar ne lai sien da ka lyngkor. Ia kine pat kiba dei ban thung die ban da khyllad noh ia ki sla kiba kiba kham sharum kiba lah ban pynwit ia ki thied ba kin kyan hapoh khyndew kata haba thung ia kitei ki shylluit kiba najan ki thied. Lada thung ha ka por lap bah, kaba bha ka long ban dà thad ia kine ki shylluit kumba shisngi ne ar sngi ha ka jaka ka bym dei sngi. Ha Hawaii ki ju pynieng ia kine da khongpong kumba shi sngi shuwa ban thung ia ki. Ki ju leh kumne khnang ba kin ym pyut lada bun eh ka um ha khyndew. Lada ka um ka bun eh, ka kham bha ruh lada thung ia ki ha ki kynton bad ym ha ka nur um. Ia kine ki shylluit bad ki tnat lung ki ju thung ha ki thliew kiba jylliew lai ne saw inshi, bad ym dei ban tap ia i shylluit iba na khlieh da ka khyndew. Ynda ki la nang san, donkam teng teng ban phut ia ki nuit ki nier, ban kynton khyndew sharud shariang jong ki bad ban khlad noh ia ki shylluit ki bym donkam. Ynda ki lah kheit ia u sohtrun, donkam ruh ban pom noh ia ki met bah kiba la kha khun bad ban iehnoh tang ia ki tnat lung kiba thymmai.

Ha kane ka ri India imat u sohtrun um da don kita ki khniang kiba pynjulor eh ia u. Ha Malabar (South India) ki ong ba don tang ka kynja 'niang shun (**meal bug**) kaba paw teng teng ha u sohtrun. U sohtrun ha kane ka ri, um da don ruh shibun ki jingpang kum sha kiwei pat ki ri. Kaba ngi ju iohi ha ri Khasi-Jaintia imat ka long tang ki kynja jingpyut kiba bun jaid kiba lah ban long na ki ba bun ki daw. (1) Kawei ka lah ban long na ka jingshoh eh ka sngi. Lada ki dieng sohtrun ki long beit da kaba ki ia kyrshan uwei ia u uwei kumba nga la batai haneng, lane lada kyrshan ia ki da u skhen, lane da tap ia u soh da ka kynja sla kata kane jingpyut kan kham duna. 2) Kawei pat ka jingpyut ka long kaba pynpyut ia u shreng. Kane ka lah ban



long na ka jingbun eh ka um ha ka khyndew. Kaba pruid ki nur kiba jylliew ha ka bri lane kaba ai sboh eit masi lane ka sboh jingthung imat ka iarap shibun ban kham pynduna ia kane ka jingpang.

U sohtrun u phuh syntiew ha u bnai February bad March, bad u ih pat ha u bnai July bad August. Katto katne ki phuh syntiew ruh tang shu kut ka jingkheit soh, bad ki soh na kine ki syntiew, ki ih ha ka por tlang. Ki sohtrun kiba mih ha kane ka por ki kham jew.

Kumba nga la pyni haneng ha kiwei pat ki ri jong ka pyrthei, khamtam ha Hawaii, Singapore bad ha Australia, ia u sohtrun ki shet bad ka shini bad ki thep ia ki ha ki tin bad ki sa phah ia ki sha kylleng ka pyrthei. Nga ngeit ba kane ka jingtrei kan sa mih shen ha ri Khasi-Jaintia ruh. Mynta hi u sohtrun na ri Khasi-Jaintia u leit ruh sha bar jylla. Hynrei katba un da poi sha kine ki jaka, bunsien u la sdang ban pyut. Ka daw kaba kongsan ka long namar ba ka jingkheit ia u sohtrun bad ka jingshalan ia u ka long ha ki rukom kiba itohmet shibun. Khnang ban lah shalan jngai ia u dei ban kheit ia u shuwa ba un ih eh. Lada kham kheit kloï pat kata ka jingthiang ka kham duna. Ki ju kheit ia u, ynda u soh u la sdang ban stem. Lah ban antad ia ka jingih jong u da kaba bsiat da ki shympriah kti, bad da kaba sngap ia ka jingriew jongu. Haba kheit ia u dei ban shu ot daka shaku kaba nep, kumba shi inshi shiteng na rum jong u soh. Lada ot jymmoin eh ia u, kata bun jaid ki jingpang ki lah ban rung ha u soh bad ban pynpyut ia u. Kaba bha ruh ka long ban kheit ia u soh ha ka por ba rang lane kaba khuid bha ka bneng, bad ynda la kheit ia u ym dei ban shu buh ha ka khyndew kaba jhieh.

Ynda la kheit ia u, ka bha ban da buh kumba katto katne por (san haduh shiphew kynta) shuwa ban thep ia u ha ki shang lane ki synduk (**crates**) ban shalan ia u sha jngai. Kine ki shang lane ki synduk kim dei ban long kiba khia eh. Ia ki sohtrun dei ban thep ynda la sop ia ki da u skum kba lane uno uno u phlang uba rkhiang. Ia ki kliar ruh ym dei ban ot, hynrei dei ban iehnoh ia ki bad ban pynpaw ia ki shabar ha ka shang

lane ka synduk. Donkam pat ba ka jingtap kan long kaba skhem bad ba yn nym don mano mano ba lah ban khlaw ia ki ha lynti. Lada ngi leh bad sumar kumne ngi ngeit ba ka jingkhahi sohtrun kan kham roi.

Ha kiwei kiwei ki bynta jong ka ri India bad ha Assam ruh don katto katne ki jait sohtrun kiba ki dang wallam dang shen na shabar. Kine ki long **Smooth Cayenne, Queen, Ripley Queen** bad **Spanish**. Nalor kine, ha Assam ki don ruh kiwei ki jait kiba ki khot ki **Desi** bad uwei pat u jait uba ki khot **Jaldhupi**. Na kine baroh imat u Smooth Cayene u long u jait uba bha tam. Ki soh jong u ki khia haduh kumba ar kilo haduh ar kilo shiteng, tang ba u long u jingthung uba donkam ka jingsumar kaba kham thikna. U Queen pat u long uba soh klo i bad uba bun bha ki soh; hynrei u soh u khia tang kumba shi kilo haduh shi kilo shiteng. Une u jait pat u soh bha hi, wat lada um da ioh eh ka jingsumar kaba paka.

U sohtrun u long u jingbam uba bha shibun na ka bynta ka met u briew bad ka jingkoit jingkhiah. U don shibun ka bitamin A, B bad C, bad shibun ki kynja met (**mineral**). U don ruh ka kynja met kaba ki khot ka **enzyme** ha ka ktien phareng kaba iarap ban tylliat ia ki kynja dohksah (**proteins**) bad kiwei kiwei ki kynja met. Kane ka enzyme ka pynpait wat ia ka shyntur lada bam than ia u sohtrun.

## U KYNPHAD, U SAINALIA BAD U SAIHON

U Kynphad u long uwei na ki jingthung u ba donkam tam ha ka pyrthei, namar u long u jingthung uba pynmih ia u kynphad na uba ki thir ksai bad thain jain. Ki ri kiba kham rep bun eh u kynphad ki long kine ter ter, Ka United States of America, ka India, ka Russia, Egypt, Brazil, Pakistan, Turkey, Mexico bad Sudan. Une u jingthung u long uba ki la thung da ki bun hajar snem ha ka pyrthei namar u long uba kongsan tam na ki kynja ksai (**fibres**) uba ka pyrthei ka pyndonkam ban thain jain. Don bun jaid ki kynphad, don kito kiba mih nyngkong nyngshap ha ka ri America (American continent), don pat imat kito kiba mih nyngkong ha Africa, bad imat don pat kito kiba mih lang ha Asia bad ha Africa. Na kine ki jaid kiba ngi shem ha ka pyrthei baroh kawei, don saw jaid (**spices**) kiba ki thung mynta ha ri India, ar na ka pyrthei thymmai bad ar pat na ka pyrthei rim.

Kito kiba na ka pyrthei thymmai (**New World**) ki long kiba ki khot (1) u Kynphad America, bad (2) u kynphad Egypt. Ia u kynphad America (**Gossyplum hirsutum**) mynta ki kham thung eh ha Punjab, hynrei u don bun ha kiwei kiwei pat ki jaka jong ka ri India. Une u don u ksai uba kham jrong bad uba long kumba inshi tam. U kynphad Egypt (**Gossyplum barbadense**) pat u long uba shait thung mynta ha Maharastra. Une u don ki ksai kiba ni bad kiba jrong bha kumba shi inshi shipawa ne palat ruh. Ia kine ar jaid ki kynphad ki pyndonkam namar kata na ka bynta ban thain ki jain kiba kham ni. Ng i ngeit ba donkam ban da pyrshang bha ia u kynphad Egypt bad ia u kynphad America ha ki jaka jaka ha ki ri lum Meghalaya.

Kito ki kynphad kiba na ka pyrthei rim (**Old World**) kiba ki ju thung ha kane ka ri India ki long u **Gossyplum**

**herbaceum**, uba long bha ha kylleng ki jaka jong ka ri India. Uba ngi shait shem eh ha Meghalaya u long u **Gossyptum arboreum**. Ha lum Garo ki don kham bun u kynphad ban ia kiwei pat ki ri lum. Nga ngeit namarkata, ba ki lum Khasi-Jaintia ruh ki long kiba bit bha ban thung kynphad bad namarkata ki donkam ban pyrshang bun jaid ki kynphad khnang ban tip u jaid uba kumno u long uba bit eh na ka bynta ki jaka ha ki lum Khasi-Jaintia. Ki kynphad herbaceum ki don u ksai u bym da jrong eh, u long tang kumba lai pawa inshi haduh shi inshi ne, hynrei u kynphad arboreum u long uba kham lyngkot shuh shuh, u long tang kumba lai pawa inshi ne duna. La katta ruh une uba hadien u kham pynmih shibun u ksai haba pyniakhlad ia u na u symbai, bad ki karkhana (**ginning factory**)kiba heh kiba pyniakhlad ia u symbai na u ksai ki sngewtynnad ban pyndonkam ia u.

U kynphad u donkam bun ka um ha ka khyndew bad ka jingsyaid ha ka lyer, ha ka por thung ia u. Katba u nangsang u donkam ban ioh slap barabor lane ban ioh um ha ka khyndew. Hynrei ynda la jan poi ka por ban seisoh, ka bneng ka dei ban kham rkhiang bad ki miet ruh ki dei ban long kiba kham khriat. Lah ban thung ia u, nga ngeit, ha ka por ba u slap u la sdang ban kut bad ban kheit ia u ha u bnai February ne March.

U kynphad u long u jingthung uba khlain, bad u lah ban mih ha ki khyndew kiba kham eh ruh. La katta ruh ka khyndew ka dei ban long kaba sboh bad kaba don ka jingbam kaba biang na ka bynta u jingthung. Ha ri dkhar ki lur ia ka khyndew bad ki sa weng noh ia ki nuit ki nier bad ki sa thung. Ka jingjingai ka lah ban long kumba (60 cm) ne 75 cm. Na uwei u jingthung kynphad ha uwei pat. Khnang ba ki symbai kin ia kynduh bad ka khyndew kaba sngem, ha ri dkhar ki ju kyllan ia ki symbai da ka eit masi im. Kane ka iarap ia ki symbai ba kin speh kloi lada duna ka um ha ka khyndew.

U kynphad ha ri India u ju ioh ar jaid ki jingpang (1) ka 'pang tlor (**cotton wilt**), bad (2) ka pang pyut thied. Khnang ban ialeh ia katei ka jingpang kaba nyngkong ki riwstad mynta ki la pynmih ki jait kynphad kiba lah ban nym ioh ia kane ka

jingpang, tang ba kine ki jait kynphad kim long kiba iadei ia ki jaka baroh. Ia katei kaba ar ka jingpang pat, ki ngeit ba dei ban ym thung kynphad slem ha kano kano ka lyngkha ha kaba la paw kane ka jingpang. Hynrei la' shem ba kane ka jingpang kaba pynpyut ia ki thied jong u kynphad ka pynpang ruh ia u rymbaija bad ia u shana badam, kumta ba kam long kaba bit ban thung da kine ki jingthung ha ka lyngkha kaba don kane ka jingpang.

U kynphad u don ruh ki nongshun kiba pynshitom ia u, bad kine ki dei ki khniang. Uba kham kongsan eh na kine u long u **ksain sawhoin** uba bam ia u shyieng jong u soh jong u kynphad (**pinkball-worm**). Une u ksain u sdang bam ia ka sla, hadien kata u sa rung hapoh u soh bad u bam ia ki shyieng bad u da pynjakhlia ia u sai kynphad. Une u khniang hadien u kylla sha ka thapbalong kaba iabeh iaka jingshai mynmiet. Kumta lah ban pyniap ia ka da ki jingriam sharak.

Mynno mynno ka ri Bengal bad katto katne ki bynta ki jong ka Assam ki pynmih ki jain kiba ki shna na u kynphad kiba itynnad katta katta, hynrei mynta la niar eh kiba tip ia kane. Ha ri Assam ruh ka jingthain jain ka la nangduh nangduh. Nga ngeit ba ka jingthung kynphad ha ri Khasi-Jaintia kan pynim pat ia ka jingthain jain bad ki Khasi- Pnar kin ym hiar sha ka jingbieit thain jain kaba imat ki nanghiar mynta.

U Sainalia (**Corchorus sp.**) uba ki khot ha ka ktien phareng **Jute** u long uwei pat u jingthung uba ki thung ha Assam na ka bynta u ksai (fibre) uba ki ioh na u. Ka Bengal ka long ka jaka ha kaba ki thung bha ia une u jingthung. Ka jing jrong u sainalia ka kot sha kumba 10 ne 12 phut. Ka snep jong u met jong u ka long kaba jyrngam lane kaba saw kat kum la u jaid u jaid. Don ar jaid (species) u sainalia uba ki ju thung ha Bengal bad ha Assam (1) U **tita pat** (**Corchorus capsularis**), bad (2) u **mitha pat** (**Corchorus olitoria**). Utei uba nyngkong u don u soh uba pyllun bad ki shyieng kiba lam iong bad ki sla pat kiba kthang. Dei na kane ka daw, ba la khot ia u u **tita pat**, kata ka sla kthang. Uba ar pat u don ki soh kiba jrong lyntuin (**cylindrical**) bad ki shyieng kiba iong bha lane kiba long

jyrngam. Ki sla pat kim kthang kum ki jong utei uba nyngkong bad namarkata la khot ia u **mitha pat**.

U sainalia u mih bha bad long ha ka por slap. Ka bneng kaba shit sngem k a long kaba bit eh ia une u jaid jingthung. U long bha ha ki jaka kiba u slap u hap kumba 70 haduh 100 inshi shisnem shisnem. La u donkam shibun ka um, la katta ruh um da long bha ha ki jaka ha kiba ka um ka neh slem. Shuwa ban thung ia u dei ban da lur ne puh bha ia ka khyndew, nangta ki sa bet ia u symbai kumba lai haduh saw kilo ha ka shi ekar, Ka kham bha ban thung khah ia u namar ki jingthung ki ieng beit bad ki tnat ruh kim da mih bun eh. Lada bun ki tnat, ki ksai kiba ioh na kum kita ki sainalia ki long ki bym da bha eh. Ki ju ot ia u haba u la phuh syntiew bha. Lada ot kham kloi ia kane, kata u ksai u kham lieh itynnad hynrei u long uba kham mot mot, hynrei lada ot kham slem pat, kata u ksai u long uba khain bha.

Ynda la ot ia u sainalia ki teh song ia u. Ia kine ki song pat ki pdem hapoh um ha ka pung kaba jyndong bad kaba khuid. Um long bha ban buh ha ka um kaba tuid shaid shaid. Kane ka jingwieh um (**retting**) ka shim por kumba lai ne saw taiew katkum ba ka jingshit ne jingkhriat jong ka um. Kumta dei ban da peit bha ioh ka snep ka la pyut eh. Ynda ka snep ka la jem ki sa khoh noh ia ka snep bad ki sa sait bad lympat ia u khnang ba ka sboh ka sbiar baroh kan mih noh bad yn sah sa tang u sainalia.

U saihon (***Crorolaria juncea***) pat u long u jingthung uba lah ban long kham bha ha ki jaka kiba duna ka um lane u slap. U long bha ha ka jylla Uttar Pradesh. Nalor kaba ki thung ia une khnang na ka bynta u saihon uba ki ioh na u, ki ju thung ruh ia u kham tam na ka bynta ban kham pynsboh ia ka khyndew. Lada puh kylla ia u ha ka khyndew, ka pynroi kumba 25 kilo ka naitrojen ha ka shi ekar. Lada thung na ka bynta u saihon, ka jingwieh (**retting**) ia u ha um ban pynmih saihon ka long syriem ia u sainalia.

## U PHAN DIENG

U Phandieng, uba ki khot ha ka ktien phareng **Tapioca** lane **Cassava** (*Manihot esculenta*), u long u jingthung uba bha ha ka jaka kiba shitsngem. Une u long u jingthung uba ki thung bha ha ki jaka kiba syriem ia ka ri Bhoi, kumta ngi shem ba u long u jingbam uba ki ju bam bha ha Kerala (South India) bad ha Malaysia. Une u jingthung tnat u wan na Brazil ha South America. Ia une u jingthung mynta ha ri India ki shu thung tang ban shu bam ha iing ha sem, hynrei ia u starch uba ioh na une u jingthung lah ban pyndonkam ha ki bun ki rukom.

Une u jingthung u long uba jrong kumba hynriew haduh khadphra phut, katkum u jaid. Ki sla jong u ki long kiba pait pnat (**lobed**). Ka mat dieng jong u ka long kaba pait tnat shibun, bad ki tnat ki long kiba rit, bad ka rong jong ka snep dieng ka lah ban long kaba jyrngam, lane kaba jyrngam lam lieh, lane kaba saw lane lam saw katkum u jaid u jaid. Une u jingthung u don ki thied, syriem ia u phan, kiba bit ban bam. Kine ki thied ki shim por naduh hynriew bnai haduh khadphra bnai ban ih, kata la u jaid u jaid.

La ki don bun jaid ki phandieng hynrei la ju kham pyniapher ia ki baroh tang ha ki ar rukom, uwei uba thieng bad uwei pat uba kthang. Kine baroh ar ki don ka kynja bih kaba khlain katta katta kaba ki khot ka **prussic acid**, hynrei uba thieng u kham duna kane ka bih, kumta lah ban bam im ia u. Kane ka bih pat ka mih noh lada shet ia une u phandieng. U phandieng u long ruh u jingbam sniang uba bha.

Ia une u jingthung, ka khyndew kaba kham sbur kata ka bym dei 'dewktieh eh, ka long kaba bha tam. Ka por kaba kham bha ban thung ia u ka long ynda u slap u la kham duna. Ia une u jingthung ki thung da ki tnat kiba la ot kumba 20cm. ka jingjrong bad sa bsuh ia ki ha ka khyndew kaba la kynroi

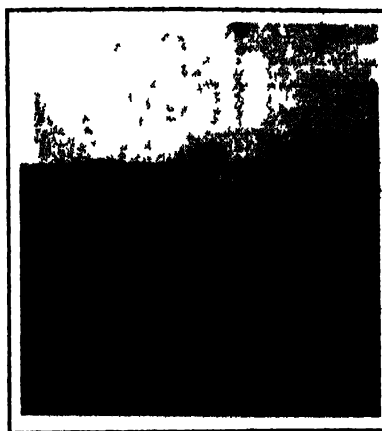
bha bad da kaba iehnoh kumba lai mat shabar. Ia kine ki tnat lah ban pynieng beit lane ban pynthiah khyndiat. Hadien kata ym donkam ban da sumar bniah ia u, lait noh ban thiew niut teng teng haba donkam. Hadien phra bnai ne, u phan u la bit ban khlaw bad lah ban ioh kumba 7500 haduh 15000 kilo shi hektar.

Ia une u phan lah ban shu bam im kumba la thoh haneng. Lane ban bam kum u phan myngngor lane u phan karo, lane lah ban ot stang ia u bad hadien kata sa shet malu mala bad sa pynrkhiang ha ka sngi bad hadien kata pat sa sdieh ia u.

Kumba 16 haduh 26 bynta na ka shispah jong une u phan u dei u starch. Don katto katne ki jaid kiba lah ban don haduh 40 bynta na ka shispah. Khnang ban ioh ia une u starch, ki don ki karkhana kiba heh ha Malaysia bad ha Java kiba tylliat ia une u phan ban pynmih ia une u starch.

Une u jingthung u don ruh katto katne ki jingpang bad ki khniang kiba pynjulor ia u. Kawei na ki jingpang kaba ki ju shem ha une u jingthung ka long ka jingpang sla (***Cercospera cassavae***). Lah ban kham pynduna ia kane ka jingpang da kaba kynshait da ka **bordeaux mixture**. Na ki khniang kiba bam ia une u jingthung, kawei ka long ka khniang kaba ki khot ha ka ktien phareng ka scale insect (***Aonidomytilus albus***). Kane ka khniang ruh ka bam ia ki sla. Lah ban pynduna ia kane ka khniang da kaba kynshait da ka kynja, umphniang sharak (**keresine emulsion**). Kawei pat ka khniang kaba bam ia ki sla jong une u jingthung ka long ka khniang kaba rit katta katta bad ka long kaba shitom ban iohi ia ka. Kane ka shait shong tang hapoh ka sla. Ynda kane ka khniang ka la jyllei bha, ki sla ki shu hap hi. Ki khot ia kane ka khniang ha ka ktien phareng **red spider** (***Tetranychus sp.***). Lah ban kham pynduna ia kane ka khniang da kaba kynshait da ka shun kaba khleh bad u kyndok.

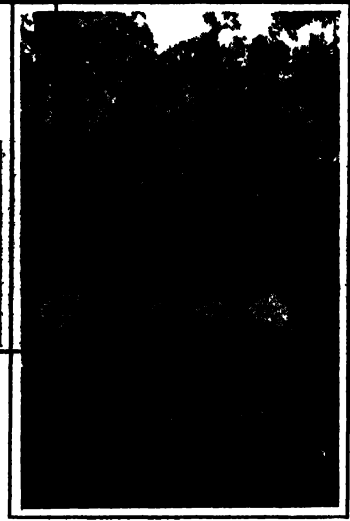




Ka rukum thung phan ha ki terrace



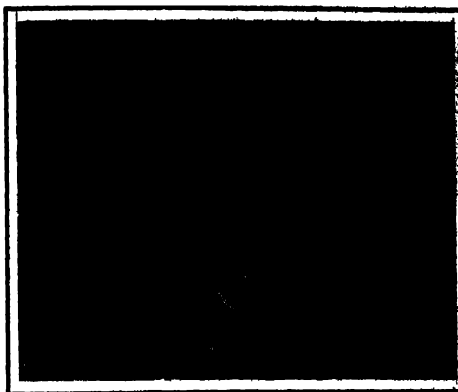
Ki terrace



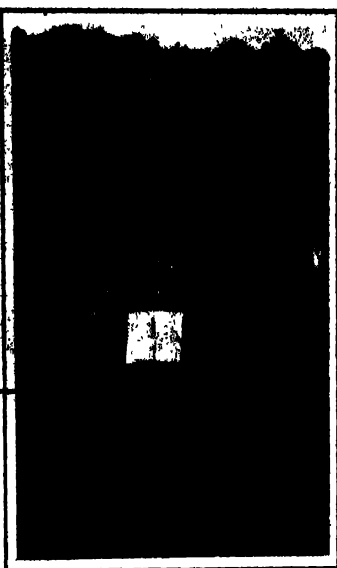
Ka wei na ki rukom leh ba iada na ka jingtuid ka khyndew



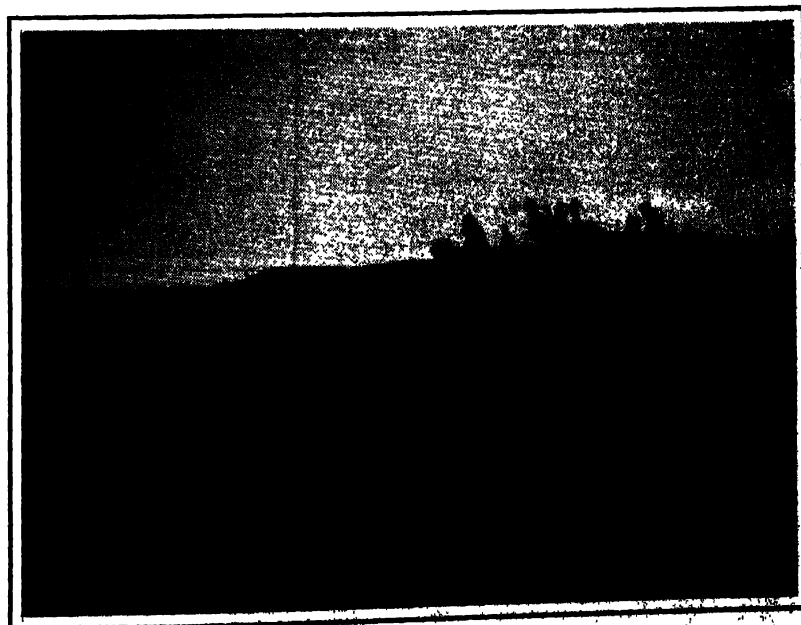
Ka tram kwai



Ki dieng soh ba la dep krap



1 R - 38 u jait kba u ba  
khambha



Ki half-moon terrace



Ka kor lur (tractor) ba pyntrei ha ki terrace



Ba lur lynkha kba da ki masi



Ka iew kwai ha Pynurela



U jait kba u ngoba ha Nongjri Umsning

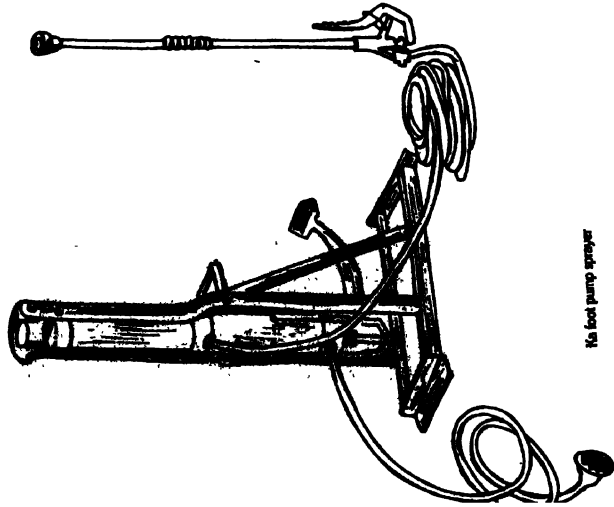


Ka kor lur (Power Tiller)

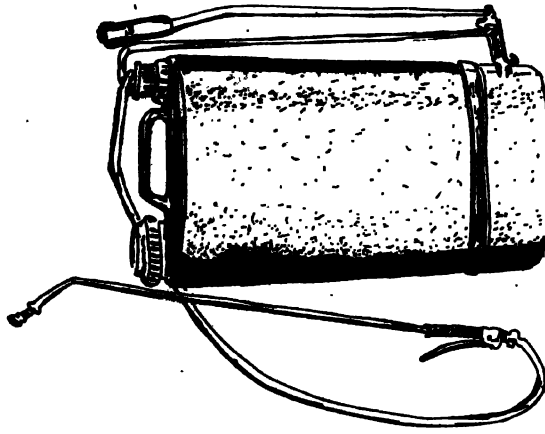


U Sainalia

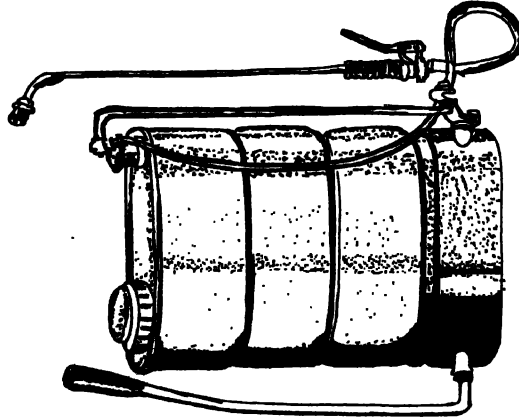
Ka jett sprayer ba kham pyadonkham ki  
nongrup



Ka foot pump sprayer



Ka knapsack sprayer ba da la plawit



Ka knapsack sprayer ba da la mong

## **KALENDAR OF OPERATION HABA REP SOHNIAMTRA**

Kat kumba ka long hi haduh mynta, ka rep sohniāmtra hangne ha ri Khasi-Jaintia kam pat long kaba da biang thikna. Bun na ki nongrep jongngi ki rep da ki spah bad hajar tynrai, hynrei kim pat nang ban sumar ia ki ha ka rukom kaba dei khnang ban ioh ka jingmih kaba biang. Bunsien ki shu ei beit kumto kumba thung ia ki dieng khlaw.

Namar kata ka long kaba kham bha ia ki nongrep ban rep tang katkum ba lah ka bor bad ban sumar bha ia ki dieng soh ha ka rukom kaba biang. Ka jingrep sohniāmtra ka don ki rukom sumar kiba u dei ban leh baroh shi snem. Kata ka long naduh ba sdang u snem da kaba pynkuid ia ki nuit ki nier ia ka bri, pushara ia u dieng met bad kumta ter ter haduh ban da kheit, jied bad die ia u soh. Ia ki kam ba dei ban leh khnang ba ka jingrep sohniāmtra kan ai ka jingmyntoi, ngi lah ban shna da ka kynja kalendar ba ki khot ka kalendar of operations kumne harum :

**Bnai** : Ki jingtrei

**Kyllalyngkot** Pyndep ia ka jing kheit soh lada ym pat dep. Shna lane pynbha ia ki half moon terrace. Pynkhuid bad mait khlaw ha bri.

**Rymphang** Pyndep ia ki jingshna bad jingpynbha ia ki terrace bad jingpynkhuid ia ka bri. Pynkhuid ia ki sohpailen ba mih ha ka met bah. Weng bad ot noh ia ki tnat ba la iap bad kiba i don jingpang. Ai shun (da ka shun byrni) ia ka khyndew ha trai ki dieng kumba 500gm shi tynrai.

**Lber** Pyndep ia ka jingpynkhuid sohpailen bad jingai shun. Pushara ia u dieng met da ka bordeaux paste naduh trai haduh kumba lai phut shaneng. Ai sboh, ai dawai sboh da ki Urea,

SSP MOP kumne : 325gm : 725gm: 300gm  
shi tynrai.

Iaiong : Pyndep ia ka jing pushara bad ai sboh. Synreit ia ki micronutrients kum u zinc sulphate manganese sulphate bad borax ha ka jingkhleh kumne 1000gm : 1000gm : 200gm ha ka arspah litar ka um-kane kan dap na ka bynta 80-100 tylli ki dieng. Synreit da ki hormones ban iada na ka jinghap ki soh kum ka 2-4-D

Jymmang : Pyndep ia ka jingsynreit micronutrients bad hormones Synriet ki dawai khniang kumka demecron bad ka dawai carbofuran ha ki tynrai. Synreit ruh ia ki dawai iada na ki jingpang kum ka bordeaux mixture lane copper fungicide bad sulphur fungicide.

Jylliew : Pyndep ia ki jingai dawai. Ai sboh biang bad ki sboh dawai kumba leh ha u bnai Rymphang ne Lber (shi paketka urea, shi paket shiteng ka SSP bad shi paket ka MOP ka dap na ka bynta 80-100 tylli ki dieng soh).

Naitung : Pyndep ia ka jing ai sboh bad dawai sboh Synreit biang ia ki dawai khniang/jingpang lada i donkam.

Nailur : Pyndep ia kitei ki kam haneng bad synreit biang ia ki micronutrients kum ka Zinc, Manganese bad Boron.

Nailar : Pyndep ia ka jingsynreit dawai khniang/jingpang bad micro nutrients. Pynkhuid biang ia ka bri.

Risaw : Pyndep ia ka jing pynkhuid bri bad sdang ia ka jingkheit soh.

Nawieng : Kheit, jied bad die ia ki soh.



Nohprah : Kheit, jied bad die ia ki soh bad sdang pynkhuid  
bri.

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**NB** : Kane haneng ka long tang ka nuksa. Ban shna kham ia  
kane ka kalendar kaban ia dei bad ka jaka wad jingmut  
na kito ki ba trei hapoh ka department jong ka Agriculture.

